February 9, 2021
File No. 3958

George Papadopoulos, Industrial Permits Section
5 Post Office Square - Suite 100 - Mailcode OEP 06-1
Boston, MA 02109-3912

Xiaodan Ruan, MassDEP
Division of Wastewater Management
Surface Water Discharge Permit Program
1 Winter Street, 5th Floor
Boston, Massachusetts 02108

Further submitted electronically to: papadopoulos.george@epa.gov
xiaodan.ruan@state.ma.us

Re: Updated Request for Extension under Compliance Schedule
Barnhardt Manufacturing Company
247 Main Road
Colrain, Massachusetts 01340
NPDES Permit No. MA0003697

Dear Mr. Papadopoulos and Ms. Ruan:

Omni Environmental Group (OEG) has prepared this updated document on behalf Barnhardt Manufacturing Company (BMC, the Permittee), 247 Main Road, Colrain, Massachusetts. This submittal provides an updated formal Request for Extension under the Compliance Schedule provided under the Modification of Authorization to Discharge under National Pollution Discharge Elimination System (NPDES) Permit No. MA0003697 issued to BMC for 247 Main Road, Colrain, Massachusetts (the Facility). The subject Modified NPDES Permit was signed by the United States Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MassDEP) Wetlands and Wastewater Programs and dated March 1, 2018 (provided in Attachement-1).

This update clarifies the request for extension of the compliance period under the Permit for a 23-month extension for all parameters listed in the compliance schedule outlined below.

Specifically, the Modified NDPES Permit states, under Part 1.B.4 Compliance Schedule:

> *The Permittee shall have up to three (3) years to comply with the new effluent limits for total copper and seasonal total phosphorus, and the more stringent C-NOEC limit. For the period starting on the effective date of this permit and ending three (3) years after the effective date, the permittee is required to monitor only and report monthly for total copper and total phosphorus for the seasonal period of May through October. After this initial three (3) year period, the permittee shall comply with the monthly average and daily maximum total copper limits of 22 µg/l as well as the seasonal, monthly average total phosphorus limit of 1.26 mg/l. For the chronic-no observed effect concentration (C-NOEC), the limit of > 5% will be in effect for the first three (3) years of the permit. After this three (3) year period, the revised limit of > 7.2 % will go into effect.*
>
> *The permittee shall submit an annual report due by January 15th of each of the first three (3) years of the permit which will detail its progress towards meeting the final permit limits for the parameters listed above. This annual report shall be submitted with the December DMR.*

Additionally, the Modified NDPES Permit states, under Part 1.B.5 Reopener for Total Copper Limit:

> *If within three (3) years of the effective date of the permit, MassDEP has promulgated a site specific copper water quality criterion for the North River, or the Permittee has submitted to MassDEP site specific study data to support a determination of such a site specific copper water quality criterion, the Permittee may request a Permit Modification to extend the compliance period for attaining the effluent limit for total copper beyond the original three (3) year period.*

The following presents considerations for each of the items listed under the above-referenced Compliance Schedule.

Compliance Period

The effective date of the NPDES Permit was March 1, 2018; therefore, the end of the three (3) year compliance period is currently March 1, 2021.

Monthly Average/Daily Maximum Total Copper Limit

Currently, BMC is only required to report effluent total copper concentrations. However, at the end of the compliance period, the monthly average and daily maximum total copper limit for the Facility is to be 22 micrograms per liter (ug/l).

As noted in the January 15, 2021 annual compliance report submitted to USEPA for RY 2020, the average influent copper concentration was 56 ug/l and the average effluent concentration was 25 ug/l.

BMC further notes that Facility data collected between December 2019 and November 2020 indicates that total copper effluent ranged from 14 to 74 ug/l.

In accordance with the above-referenced NPDES Permit Part 1.B.5, BMC conducted a study of water quality data generated for ambient upstream and downstream waters and Facility effluents between May through December 2019 and May through June 2020. The study was conducted in accordance with a Quality Assurance Project Plan (QAPP) that was submitted to MassDEP and USEPA in December 2018.

A Project Completion Report entitled "Water Quality Monitoring for Application of the Biotic Ligand Model for Facility-Specific Copper Criteria" summarized the data collected under the QAPP and was submitted to MassDEP on November 2, 2020 regarding the utilization of the Biotic Ligand Model (BLM) in support of a determination of a site-specific copper water quality criterion for the Facility. To date, no formal response has been provided by MassDEP on their interpretation under BLM analysis or determination for a Facility-specific copper water quality criterion.

Per the above-referenced NPDES Permit Part 1.B.5, it would appear that a request for a Permit Modification to extend the compliance period for attaining the effluent limit for total copper beyond March 1, 2021 is allowable since the Permittee has submitted the site-specific Project Completion Report to MassDEP as of November 2, 2020.

Seasonal Monthly Average Total Phosphorus Limit

Currently, BMC is only required to only report effluent total phosphorus (TP) concentrations. However, the seasonal limit of 1.26 milligrams per liter (mg/l) for May through October will be in effect at the end of the compliance period.

BMC took enterprising steps to identify chemicals used in manufacturing at the Facility that contained phosphorus. The only chemical found to contain significant amounts of phosphorus was

a boiler treatment chemical, which was removed from Facility use in mid-August 2019 and replaced with a suitable alternative.

As noted in the January 15, 2021 annual compliance report submitted to USEPA for RY 2020, the average influent TP concentration was 5.14 mg/l and the average effluent concentration was 2.99 mg/l. BMC further notes that Facility data collected between December 2019 and November 2020 indicates that TP effluent ranged from 2.60 to 8.00 mg/l. It has been observed that on average, 87% of the effluent TP is soluble phosphate (PO_4), which is amenable to precipitation using aluminum salts.

Laboratory Trials for Copper and Phosphorus Reduction

In an effort to address the forthcoming Permit limits for total copper and total phosphorus, BMC has conducted significant laboratory trials to identify viable treatment alternatives and dosage rates to employ at the Facility.

The treatment trials indicate that the application of poly aluminum chloride (PAC) is an effective additive providing for a reduction of both total phosphorus and total copper in Facility effluent at levels anticipated to be below forthcoming Permit limits. BMC has determined that the installation of a PAC feed system to either: 1) the sludge return of the aeration basin; or 2) to the north clarifier could be installed at the Facility to meet treatment goals.

In January 2021, BMC has held discussion with MassDEP to advise on the anticipated use of a PAC chemical feed system and to obtain clarification on the engineering requirements that will be necessary to support a modification to the Facility treatment works under a WM 16 Treatment Works Plan Approval, without Permit Modification and in accordance with the regulations under 314 CMR 3.00.

Also, in January 2021, BMC has issued a Request for Proposal (RFP) entitled “Design of Poly Aluminum Chloride feed system” to suitable engineering firms with a minimum of ten years of experience with design of waste water treatment facilities, expertise with instrumentation and automated controls for chemical dosing systems; and employing one or more professional engineer (PE) licensed in the Commonwealth of Massachusetts.

With regards to the PAC chemical feed design system, BMC has selected a suitable engineering firm in February 2021. With this engineering firm BMC anticipates: 1) finalizing the PAC design and Facility layout; 2) submitting an application to MassDEP for the finalized PAC design; 3) concurrently, submitting a similar document to USEPA in accordance with NPDES Permit Part 1.C.3F

(Notification of proposal to add or replace chemical additives and bio-remedial agents including microbes); 4) acquisition of necessary materials, approvals and permits for construction; 5) installation of the selected PAC design at the Facility; and 6) startup and operation of the PAC system in accordance with the approved/permitted design.

Whole Effluent Toxicity

Currently, the permit limit for acute toxicity is an LC50 of >100% and for chronic toxicity, the No Observed Effect Concentration (C-NOEC) limit is >5%. At the end of the compliance period the C-NOEC becomes more restrictive with a limit of >7.2%.

As noted in the January 15, 2021 annual compliance report submitted to USEPA for RY 2020, the 5% LC50 values represent values of <5% and were not in compliance with the current Permit. Acute toxicity levels exceeded (were more toxic) the Permit limit during January and April quarters while the chronic limit was exceeded for January, April, and October quarters.

Laboratory Trials for Whole Effluent Toxicity

In an effort to address the current toxicity issues and forthcoming Permit reduction for C-NOEC, BMC has conducted significant laboratory testing and evaluations in an effort to identify causes for toxicity in Facility effluent.

As noted in the January 15, 2021 annual compliance report submitted to USEPA for RY 2020, testing and evaluations performed by BMC included:

- hardness adjustments
    - no improvements to chronic toxicity were revealed.

- cotton water scour testing
    - scour bath indicated significant levels of acute toxicity; and therefore, chronic toxicity was not analyzed. Results indicated the potential that toxicity may be originating in whole or in part from the cotton.

- pH adjustments
    - no toxicity improvements were observed.

- defoamer and sludge dewatering polymer
    - use of a defoamer within polydimethylsiloxane (PDMS) and sludge dewatering polymer was discontinued in July 2020. Elimination of the defoamer and sludge dewatering polymer did not reduce the chronic toxicity.

- herbicide and pesticide testing
    - It is not likely that the observed toxicity is caused by pesticides or herbicides applied to the cotton being processed at the time of sampling.

- bleaching process alterations
    - Changes in the bleaching process are being implemented that should reduce the amount of caustic, acid and peroxide used.
    - Facility effluent toxicity testing will be performed during the 1st quarter of 2021 to evaluate the effect of these changes.

In addition, acute and chronic toxicity testing has been performed following various treatments in an effort to identify the class of contaminants contributing to effluent toxicity. The treatments provided were:

1. Filtration with 0.45micron (µm) filter to remove colloidal materials;
2. Ethylenediaminetetraacetic acid (EDTA) treatment to chelate copper and other metals;
3. Activated carbon treatment to remove organics and other adsorbable material;
4. Chemical coagulation to remove organics and colloidal materials;
5. Calcium addition to increase hardness; and
6. Adjustment of pH to reduce alkalinity.

None of these treatments significantly reduced toxicity.

Pesticides were not found in the WWTP influent or effluent. Only a trace of glyphosate, an ingredient found in many herbicides, was detected in the WWTP influent. However, it was not detected in the effluent.

The use of defoamer and sludge dewatering polymer was curtailed to evaluate their potential impact on toxicity. However, no improvement was observed based on WWTP effluent test results.

The use of process chemicals was evaluated resulting in the elimination and replacement of one scouring agent and some reduction in the amount of caustic used in bleaching and acid used for neutralization.

Currently, BMC is undertaking additional testing and studies to evaluate the effect of changes in the scouring process on effluent toxicity.

Recent Toxicity Analytical Report

It should be noted that the whole effluent toxicity sampling performed in January 2021 has passed for the current acute and chronic Permit limits, and further passes the Permit limits at the end of the compliance period. This data is viewed as an indicator that recent decreases in caustic concentrations used in both scour and bleach steps, subsequently reducing salinity of effluent, may be providing positive effects on reduction of toxicity in Facility effluent.

However, BMC plans to conduct additional study to validate the efficacy of these measures as a means to reduce acute/chronic toxicity in Facility effluent. The laboratory analytical report is provided in Attachment-2.

Annual Reports

On behalf of BMC, Applied Technology and Engineering, P.C., prepared and submitted the annual compliance reports required under Part 1.B.4 of the Permit which detailed Facility efforts towards meeting the Permit limits at the end of the compliance period for total copper, total phosphorus, and toxicity for RY 2018 through RY 2020.

Delays and Complications Resulting From COVID

Like nearly all companies across sectors, in 2020, the largest health and economic crisis in recent history brought on by COVID-19 forced BMC into extraordinary measures to protect their people, maintain operations and meet customer expectations.

Amidst these challenges, BMC made significant strides in developing a conceptual design and releasing an RFP for a PAC feed system aimed at reducing total copper and total phosphorus in Facility effluent to levels that will meet future Permit limitations. Significant future budgetary allocation has been made for the final design, materials, installation, and operation of the PAC feed system. Substantial resources were devoted into continued investigation of effluent toxicity and BMC plans to continue these efforts to ascertain causation and identify materials, process and/or treatment alternatives to reduce effluent toxicity to levels that will meet future Permit limitations.

That said, BMC must acknowledge that their ability to achieve these goals has been substantially hampered by COVID-19, including complications to its daily operations, reduced ability for staff travel (e.g., from BMC Corporate headquarters to the Colrain Facility) and conduct Facility meetings with outside parties, and delays in schedule and vendor support.

Request for Permit Modification

BMC, the Permittee under NPDES Permit No. MA0003697, hereby requests a Permit Modification from USEPA and MassDEP to extend the Compliance Schedule for monthly average and daily maximum total copper, monthly average seasonal phosphorus, and C-NOEC limits. The request is in consideration of 1) awaiting a formal response from MassDEP on their interpretation under BLM analysis and determination for a Facility-specific copper water quality criterion; 2) anticipated timeline supporting the installation of a PAC chemical feed system at the Facility for the treatment of total phosphorus and total copper; 3) the additional testing and studies necessary to further evaluate on-going issues with toxicity in Facility effluent; and 4) the delays and complications brought on by COVID-19.

Therefore, BMC (the Permittee) is requesting a 23-month (e.g., through January 2023) extension for Permit compliance with monthly average and daily maximum total copper, monthly average seasonal phosphorus limits to complete the installation and operation of a PAC feed system and for Permit compliance with the C-NOEC limit to continue investigation and identification of materials, process and/or treatment alternatives. The limits referenced under Part 1.B.4 Compliance Schedule would go into effect during the final month of the Permit in February 2023.

Should you have any questions, require additional information or if you would like to discuss this request, please do not hesitate to contact the undersigned at (978) 256-6766.

Sincerely,

Omni Environmental Group

Gregory R. Morand

Gregory R. Morand, LSP
Principal

Attachments
Cc: BMC

ATTACHMENT-1

MODIFICATION OF AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§1251 et seq.; the "CWA", and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Barnhardt Manufacturing Company

is authorized to discharge from the facility located at

Barnhardt Manufacturing Company
247 Main Road
Colrain, MA 01340

to receiving water named

North River (Deerfield River Watershed)

in accordance with effluent limitations, monitoring requirements and other conditions set forth in the permit issued on September 19, 2017, except as modified with new language in bold in Part I.B.5 on Page 11 of this modification (a new reopener clause for total copper) and new language in bold in footnote 9 on Page 6, which references the reopener clause.

This permit modification shall become effective on the date of signature.

This permit and the authorization to discharge expire at midnight, February 28, 2023.

This modified permit is issued pursuant to 40 C.F.R. §124.5, and revises and supersedes the permit that was issued on September 19, 2017.

This permit consists of this cover page, 14 pages in Part I including effluent limitations, monitoring requirements, reporting requirements and state permit conditions, 7 pages in Attachment A — Freshwater Chronic Toxicity Test Procedure and Protocol (March 2013), and 25 pages in Part II, the Standard Conditions.

Signed this 1st day of March , 2018

S/SIGNATURE ON FILE	S/SIGNATURE ON FILE
Ken Moraff, Director	Lealdon Langley, Director
Office of Ecosystem Protection	Massachusetts Wetlands and Wastewater Programs
U.S. Environmental Protection Agency	Department of Environmental Protection
Region 1	Commonwealth of Massachusetts
Boston, MA	Boston, MA

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated process water through **Outfall Serial Number 001** to the North River. Such discharge shall be limited and monitored by the Permittee as specified below:

Effluent Characteristic	**Discharge Limitation**		**Monitoring Requirements[1,2]**	
	Average Monthly	**Maximum Daily**	**Measurement Frequency[3,4]**	**Sample Type**
Flow Rate [5]	Report MGD	0.89 MGD	Continuous	Recorder
pH [6]	6.5 - 9.0 SU		1/day	Grab
Production Rate [7]	Report	Report	1/day	Estimate
BOD_5	292 lbs/day	510 lbs/day	1/month	Composite [8]
Total Suspended Solids (TSS)	350 lbs/day	510 lbs/day	1/month	Composite [8]
COD	3640 lbs/day	7280 lbs/day	1/quarter	Composite [8]
Sulfide, Total	1.0 lb/day	2.0 lbs/day	1/quarter	Grab
Chromium, Total	Report lbs/day	1.1 lbs/day	1/year	Composite [8]
Phenols, Total	Report lbs/day	1.0 lb/day	1/quarter	Grab
Ammonia-Nitrogen (as N)	Report mg/l and lbs/day	Report mg/l and lbs/day	1/quarter	Composite [8]
Total Kjeldahl Nitrogen (TKN)	Report mg/l and lbs/day	Report mg/l and lbs/day	2/month	Composite [8]
Nitrite-Nitrate (as N)	Report mg/l and lbs/day	Report mg/l and lbs/day	2/month	Composite [8]
Total Nitrogen	Report lbs/day	Report lbs/day	2/month	Composite [8]
Total Phosphorus (May – October) [9]	Report/1.26mg/l	Report mg/l	1/month	Composite [8]
Total Phosphorus (November-April)	Report mg/l	Report mg/l	1/month	Composite [8]
E. Coli (April 1 – October 31)	126 cfu/100 ml	409 cfu/100 ml	1/week	Grab
Copper, Total [9]	Report /22 µg/l	Report/ 22 µg/l	1/month	Composite [8]
Temperature	Report ^oF	Report ^oF	1/month	Grab

See pages 5 and 6 for footnotes

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Effluent Characteristic	Discharge Limitation	Monitoring Requirements[1,2]	
	Maximum Daily	Measurement Frequency[3,4]	Sample Type
Whole Effluent Toxicity [10,11,12]			
LC_{50}	$\geq$ 100 %	1/quarter	Composite [8]
C-NOEC [9]	$\geq$ 5 %, $\geq$ 7.2 %	1/quarter	Composite [8]
Hardness	Report mg/L	1/quarter	Composite [8]
Total Residual Chlorine	Report mg/L	1/quarter	Grab
Alkalinity	Report mg/L	1/quarter	Composite [8]
pH	Report SU	1/quarter	Grab
Specific Conductance	Report µmhos/cm	1/quarter	Composite [8]
Total Solids	Report mg/L	1/quarter	Composite [8]
Ammonia	Report mg/L	1/quarter	Composite [8]
Total Organic Carbon	Report mg/L	1/quarter	Composite [8]
Cadmium, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Lead, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Copper, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Zinc, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Nickel, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Aluminum, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Total Dissolved Solids	Report mg/L	1/quarter	Composite [8]

See pages 5 and 6 for footnotes

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During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated process water through **Outfall Serial Number 001** to the North River. The three (3) samples taken from the North River, considered to be the receiving water control, shall be monitored by the Permittee as specified below as required by the Whole Effluent Toxicity testing requirement.

Ambient Characteristic[11]	**Ambient Reporting Requirements**	**Monitoring Requirements[1,2]**	
	Maximum Daily	**Measurement Frequency[3,4]**	**Sample Type**
Hardness	Report mg/L	1/quarter	Grab
Alkalinity	Report mg/L	1/quarter	Grab
pH	Report SU	1/quarter	Grab
Specific Conductance	Report µmhos/cm	1/quarter	Grab
Ammonia	Report mg/L	1/quarter	Grab
Total Organic Carbon	Report mg/L	1/quarter	Grab
Cadmium, Total Recoverable	Report mg/L	1/quarter	Grab
Lead, Total Recoverable	Report mg/L	1/quarter	Grab
Copper, Total Recoverable	Report mg/L	1/quarter	Grab
Zinc, Total Recoverable	Report mg/L	1/quarter	Grab
Nickel, Total Recoverable	Report mg/L	1/quarter	Grab
Aluminum, Total Recoverable	Report mg/L	1/quarter	Grab

See pages 5 and 6 for footnotes

Footnotes:

1. The samples for Outfall 001 shall be collected at the discharge point to the North River. Samples shall be taken at a consistent location(s) and consistent times which yield data representative of the process water effluent just prior to discharge to the North River and prior to comingling with any non-process waters, if such comingling occurs. Changes in sampling location must be approved in writing by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP).

2. In accordance with 40 C.F.R. § 122.44(i)(1)(iv), the Permittee shall use sufficiently sensitive test procedures (i.e., methods) approved under 40 C.F.R. Part 136 or required under 40 C.F.R. Chapter I, Subchapter N or O, for the analysis of pollutants or pollutant parameters limited in this permit (except WET limits). A method is considered "sufficiently sensitive" when either (1) the method minimum level (ML) is at or below the level of the effluent limit established in this permit for the measured pollutant or pollutant parameter; or (2) the method has the lowest ML of the analytical methods approved under 40 C.F.R. Part 136 or required under 40 C.F.R. Chapter I, Subchapter N or O for the measured pollutant or pollutant parameter. The ML is not the minimum level of detection, but rather the lowest level at which the test equipment produces a recognizable signal and acceptable calibration point for a pollutant or pollutant parameter, representative of the lowest concentration at which a pollutant or pollutant parameter can be measured with a known level of confidence. For the purposes of this permit, the detection limit (DL) is the lowest concentration that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method during routine laboratory operating conditions (i.e., the level above which an actual value is reported for an analyte, and the level below which an analyte is reported as non-detect).

3. Measurement frequency of 1/day is defined as the recording of one measurement for each 24 hour period. Measurement frequency of 1/week is defined as the sampling of one discharge event in each seven-day period. Measurement frequency of 1/month is defined as the sampling of one discharge event in each calendar month. Measurement frequency of 1/year is defined as the sampling of one discharge event which occurs during the month of May. Quarterly samples shall be collected during the second weeks in January, April, July, and October.

4. The Permittee shall submit the results to EPA of any additional testing done above that which is required herein, if it is in accordance with EPA approved methods. If no sampling result can be reported during one or more of the measurement frequencies defined above, the Permittee must report the appropriate No Data Indicator Code (e.g., "C" for "No Discharge") found in Attachment E of *NPDES Permit Program Instructions for the Discharge Monitoring Report Forms (DMRs).*

5. Flow rate shall be reported in million gallons per day (MGD). The flow shall be continuously measured and recorded using a flow meter. The total flow for each operating date shall be recorded and attached to each monthly DMR form.

6. The pH of the effluent shall be not less than 6.5 or greater than 9.0 standard units (s.u.) but not more than 0.5 standard units outside of the naturally occurring range. There shall be no change from natural background conditions that would impair any use assigned to the class of the receiving water.

7. Total production rate of finished goods in pounds per day.

8. A 24-hour composite shall consist of twenty-four (24) grab samples collected at hourly intervals during a twenty-four hour period (i.e., 0700 Monday to 0700 Tuesday), combined proportionally to flow.

9. For the parameters total copper and total phosphorus (May through October), there will be a monitor only requirement for the period starting on the effective date of this permit and ending three (3) years after the effective date. This is consistent with the three (3) year compliance schedule outlined in Part I.B.4 of the final permit. After this 3 year period, the permittee shall comply with the monthly average and daily maximum total copper limits of 22 µg/l as well as the seasonal, monthly average total phosphorus limit of 1.26 mg/l. For the chronic-no observed effect concentration (C-NOEC), the prior permit limit of $\geq$ 5% will be in effect for the first three (3) years of the permit as specified above in this footnote. After this 3 year period, the revised limit of $\geq$ 7.2 % will go into effect. See Part I.B.4 for additional requirements regarding the compliance schedule **and Part I.B.5 for copper reopener clause**.

10. The Permittee shall conduct chronic whole effluent toxicity (WET) tests once per calendar quarter following the effective date of the permit. The tests must be performed in accordance with test procedures and protocols specified in Attachment A of this permit using the daphnid, *Ceriodaphnia dubia*. LC_{50} and C-NOEC are defined in Part II.E.3 of this permit. WET test samples shall be collected during the months of January, April, July, and October and the test results shall be submitted with the discharge monitoring reports (DMRs), no later than the 15th day of the month following the completed reporting period. For example, the WET test results for January shall be submitted with the February DMR, no later than March 15th.

WET Testing Months	Submit Results by:	Test Species	Chronic Limit	Acute Limit
January April July October	March 15th June 15th September 15th December 15th	*Ceriodaphnia dubia* (daphnid)	C-NOEC $\geq$ 7.2%	$LC_{50} \geq$ 100%

11. The Permittee shall conduct the analyses specified in Attachment A, Part VI. CHEMICAL ANALYSIS, of this permit. **For 100% effluent**, the Permittee shall report results for the parameters listed on Page 3, Part I.A., Whole Effluent Toxicity, hardness through total dissolved solids, inclusive. The dilution water sample for the WET tests shall be **a receiving water control** (i.e., 0% effluent) consisting of three grab samples (defined in Part II.E.) collected from the North River at a point immediately upstream, outside of Outfall 001's zone of influence at a reasonably accessible location and taken over a 1-hour period. For this receiving water control, the Permittee shall report results for the parameters listed on Page 4. Even where an alternate dilution water is permitted, the receiving water control (0% effluent) must still be analyzed. MLs and methods are specified in Attachment A., Part VI. CHEMICAL ANALYSIS. Sampling for any parameter required for WET may be used to satisfy any duplicative sampling required for that parameter in this permit, so long as the timing of sampling for WET coincides with the sample timing otherwise required for that parameter within this permit.

12. If the toxicity test uses receiving water as diluent and the receiving water is found to be toxic or unreliable, the permittee shall follow procedures outlined in Section IV (Dilution Water) of Attachment A in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required in Attachment A, EPA-New England has developed a Self-Implementing Alternative Dilution Water Guidance document (called "Guidance Document") which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance document may be found at: https://www3.epa.gov/region1/npdes/permits/generic/Alternatedilutionwaterguidance.pdf. If this Guidance Document is revoked, the permittee shall revert to obtaining approval as outlined in Attachment A. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in Attachment A.

Part I.A. continued.

2. The discharge shall not cause a violation of the water quality standards of the receiving waters.

3. The discharge shall not contain floating, suspended and settleable solids, oil and grease, petrochemicals and other volatile or synthetic organic pollutants.

4. The discharge shall not produce objectionable odor, color, taste, or turbidity.

5. The discharge shall not contain pollutants in concentrations or combinations or cause alterations that impair the existing uses of the receiving water, or interfere with the attainment of designated uses in the receiving water or downstream and adjacent waterbody segments.

6. The discharge shall not contain pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

7. The Permittee shall properly operate and maintain the pollution control equipment.

8. The Permittee shall implement preventative maintenance procedures for the pollution control equipment.

9. The Permittee shall implement procedures and maintenance schedule for removal and disposal of solids and/or sludge.

10. The permittee shall not use fungicides or slimicides containing trichlorophenol or pentachlorophenol.

11. Any intake water that is used solely for cooling purposes shall not be directly returned to the receiving water.

12. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe (40 C.F.R. §122.42):

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
    i. 100 micrograms per liter (µg/L);
    ii. 200 µg/L for acrolein and acrylonitrite; 500 µg/L for 2,4-dinitrophenol; and one milligram per liter (mg/L) for antimony;
    iii. Five times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or

iv. Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f) and Massachusetts regulations.

b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

i. 500 µg/L;
ii. One mg/L for antimony;
iii. 10 times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or
iv. Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f) and Massachusetts regulations.

13. This permit may be modified in accordance with 40 C.F.R. Section 122.62(a)(3) if the standards or regulations on which the permit is based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit is issued in accordance with 40 C.F.R. Section 122.62(a)(3).

B. SPECIAL CONDITIONS

1. Best Management Practices (BMP) Plan

The permittee shall continue to implement and maintain a Best Management Practices (BMP) Plan designed to reduce or prevent the discharge of pollutants in process water to waters of the United States. The BMP Plan shall be a written document that is consistent with the terms of the permit and identifies and describes the BMPs employed by the facility in operating process water controls.

Within six months following the effective date of the permit, the Permittee shall update and certify that the BMP Plan meets the requirements of this permit, and that it reduces the pollutants discharged in process water to the extent practicable. The BMP Plan and certification shall be signed in accordance with the requirements identified in 40 C.F.R. §122.22. A copy of the BMP Plan and certification shall be maintained at the Permittee's facility and made available to EPA and MassDEP upon request.

The permittee shall amend and update the BMP Plan **within thirty (30) days** for any changes at the facility affecting the BMP Plan. Such changes may include, but are not limited to, changes in the design, construction, operation, or maintenance of the facility, which have a significant effect on the potential for the discharge of pollutants to the waters of the United States. The amended BMP Plan shall be certified as described above.

The permittee shall certify at least annually that the facility is in compliance with the requirements of the BMP Plan. If the facility is not in compliance with any aspect of the BMP Plan, the annual certification shall state the noncompliance (e.g., a selected BMP is not achieving the control necessary to meet a numeric or non-numeric effluent limitation) and the actions which were undertaken to remedy such noncompliance (e.g., the selection, design and implementation of an alternate BMP). Such annual certifications shall be signed, maintained at the facility, and made available to EPA and MassDEP as described above.

The BMP Plan shall include, at a minimum, the following items:

a. Selection, design, installation, implementation and maintenance of control measures necessary to meet the effluent limitations in this permit, including the non-numeric limitations and conditions in Part I.A. Any control measures shall be used in accordance with good engineering practices and manufacturer's specifications.

b. A description of the pollution control equipment and procedures used to minimize the discharge of suspended solids, floating solids, foam/scum/debris, visible oil sheen, and settleable solids to surface waters.

c. Preventative maintenance procedures for the pollution control equipment.

d. Procedures for handling facility wastes, including schedules for removal, handling and disposal of materials, a description of where solids removed from the pollution control equipment or appurtenances, including sludge, are stored and/or disposed of, and the control measures used to prevent the removed solids from reentering the receiving water. If facility wastes are removed from the site, describe the destination and the method of disposal and/or reuse.

e. A record of the following information for all chemicals and additives used at the facility, including all chemicals used in the treatment processes at the facility (flocculation, clarification, filtration, and disinfection), and for control of biological growth, and corrosion and scale in water pipes:

i. Product name, chemical formula, and manufacturer of the additive;
ii. Purpose or use of the additive;
iii. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each additive;
iv. The frequency (e.g., hourly, daily), duration (e.g., hours, days), quantity (e.g., maximum and average), and method of application for the additive; and
v. The vendor's reported aquatic toxicity, when available (NOAEL and/or LC50 in percent for aquatic organism(s)).

f. A description of the training to be provided for employees to assure they understand the goals, objectives, and procedures of the BMP Plan, the requirements of the NPDES Permit, and their individual responsibilities for complying with the goals and objectives of the BMP Plan and the NPDES permit.

g. Minimum documentation requirements are as follows:

i. Records of operational and preventive maintenance activities, equipment inspections, procedure audits, and personnel training;
ii. Records of the collection and analysis of samples, including, but not limited to, sample location, any calculations done at the time of sampling, any sampling or analytical methods used for samples analyzed on site, and sample results; and
iii. All documentation of BMP Plan activities shall be kept at the facility and provided to EPA or MassDEP upon request.

2. Treatment Plant Optimization for Nitrogen

The permittee shall complete an evaluation of alternative methods of operating its existing wastewater treatment facility to optimize the removal of nitrogen, and submit a report to EPA and MassDEP documenting this evaluation. This report shall present a description of recommended operational changes within one (1) year of the effective date of the permit. The permittee shall implement the recommended operational changes in order to maintain the existing mass discharge loading of total nitrogen, which will be measured as an annual average. The annual average total nitrogen load from this facility (for the period of March 2011 – March 2016) is estimated to be 67.3 lbs/day. The permittee shall submit an annual report due by January 15th of each year and submitted with the December DMR that summarizes activities related to optimizing the effectiveness of nitrogen removal methods. The report shall also include documentation of the annual nitrogen discharge load from the facility and how that load compares to previous years.

3. Whole Effluent Toxicity (WET) Testing Reduction

The Permittee may request a reduction in Whole Effluent Toxicity testing requirements by submitting results for a minimum of four (4) consecutive tests, all of which must be valid tests that demonstrate compliance with the WET testing requirements in this permit. Until written notice is received from EPA indicating that the WET testing requirements have been changed, the Permittee is required to continue testing as specified in this permit.

4. Compliance Schedule

The Permittee shall have up to three (3) years to comply with the new effluent limits for total copper and seasonal total phosphorus, and the more stringent C-NOEC limit. For the period starting on the effective date of this permit and ending three (3) years after the effective date, the permittee is required to monitor only and report monthly for total copper and total phosphorus for the seasonal period of May through October. After this initial three (3) year period, the permittee shall comply with the monthly average and daily maximum total copper limits of 22 µg/l as well as the seasonal, monthly average total phosphorus limit of 1.26 mg/l. For the chronic-no observed effect concentration (C-NOEC), the limit of $\geq$ 5% will be in effect for the first three (3) years of the permit. After this three (3) year period, the revised limit of $\geq$ 7.2 % will go into effect.

The permittee shall submit an annual report due by January 15th of each of the first three (3) years of the permit which will detail its progress towards meeting the final permit limits for the parameters listed above. This annual report shall be submitted with the December DMR.

5. Reopener Clause for Total Copper Limit

If within three (3) years of the effective date of the permit, MassDEP has promulgated a site specific copper water quality criterion for the North River, or the Permittee has submitted to MassDEP site specific study data to support a determination of such a site specific copper water quality criterion, the Permittee may request a Permit Modification to extend the compliance period for attaining the effluent limit for total copper beyond the original three (3) year period.

C. REPORTING REQUIREMENTS

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 C.F.R. Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to EPA and the MassDEP within the time frames specified within the permit.

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

The permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and MassDEP no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or MassDEP.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. Permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP. (See Part I.C.5 for more information on state reporting.) Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the particular report due date specified in this permit.

3. Submittal of Requests and Reports to EPA/OEP

   The following requests, reports, and information described in this permit shall be submitted to the EPA/OEP NPDES Applications Coordinator in the EPA Office Ecosystem Protection (OEP).

   A. Transfer of permit notice
   B. Request for changes in sampling location
   C. Request for reduction in testing frequency
   D. Request for reduction in WET testing requirement
   E. Report on unacceptable dilution water / request for alternative dilution water for WET testing
   F. Notification of proposal to add or replace chemicals additives and bio-remedial agents including microbes
   G. Evaluation of Alternative Methods for Nitrogen Removal Report
   H. Annual Nitrogen Removal Optimization Reports
   I. Annual Compliance Schedule Reports for Copper, Phosphorus, and WET

   These reports, information, and requests shall be submitted to EPA/OEP electronically at R1NPDES.Notices.OEP@epa.gov or by hard copy mail to the following address:

   U.S. Environmental Protection Agency
   Office of Ecosystem Protection
   EPA/OEP NPDES Applications Coordinator
   5 Post Office Square - Suite 100 (OEP06-03)
   Boston, MA 02109-3912

4. Submittal of Reports in Hard Copy Form

   The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to EPA.

   A. Written notifications required under Part II
   B. Notice of unauthorized discharges

This information shall be submitted to EPA/OES at the following address:

U.S. Environmental Protection Agency
Office of Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-SMR)
Boston, MA 02109-3912

5. State Reporting

Transfer or termination of permit notices shall be submitted to:

MassDEP
Bureau of Water Resources
Wastewater Management Program
1 Winter Street, 5th Floor
Boston, MA 02108

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.C.3 and I.C.4 shall also be submitted to the State at the following addresses:

MassDEP – Western Region
Bureau of Water Resources
436 Dwight Street, Suite 402
Springfield, MA 01103

Except that, copies of toxicity tests and annual nitrogen optimization reports shall be submitted to:

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

6. Verbal Reports and Verbal Notifications

Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to MassDEP. This includes verbal reports and notifications which require reporting within 24 hours. (As examples, see Part II.B.4.c. (2), Part II.B.5.c. (3), and Part II.D.1.e.) Verbal reports and verbal notifications shall be made to EPA's Office of Environmental Stewardship at: **617-918-1510**

D. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 C.M.R. 3.19, are hereby incorporated by reference into this state surface water discharge permit.

2. This authorization also incorporates the state water quality certification issued by MassDEP under §401(a) of the Federal Clean Water Act, 40 CFR 124.53, M.G.L. c. 21, §27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

3. Each Agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of this permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared, invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as an NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of Federal law, this permit shall remain in full force and effect under State law as a permit issued by the Commonwealth of Massachusetts.

MODIFICATION OF AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§1251 et seq.; the "CWA", and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Barnhardt Manufacturing Company

is authorized to discharge from the facility located at

Barnhardt Manufacturing Company
247 Main Road
Colrain, MA 01340

to receiving water named

North River (Deerfield River Watershed)

in accordance with effluent limitations, monitoring requirements and other conditions set forth in the permit issued on September 19, 2017, except as modified with new language in bold in Part I.B.5 on Page 11 of this modification (a new reopener clause for total copper) and new language in bold in footnote 9 on Page 6, which references the reopener clause.

This permit modification shall become effective on the first day of the calendar month following sixty (60) days after signature if comments are received.*

This permit and the authorization to discharge expire at midnight, November 30, 2022.

This modified permit is issued pursuant to 40 C.F.R. §124.5, and revises and supersedes the permit that was issued on September 19, 2017.

This permit consists of this cover page, 14 pages in Part I including effluent limitations, monitoring requirements, reporting requirements and state permit conditions, 7 pages in Attachment A — Freshwater Chronic Toxicity Test Procedure and Protocol (March 2013), and 25 pages in Part II, the Standard Conditions.

Signed this day of , 2018

Ken Moraff, Director	Lealdon Langley, Director
Office of Ecosystem Protection	Massachusetts Wetlands and Wastewater Programs
U.S. Environmental Protection Agency	Department of Environmental Protection
Region 1	Commonwealth of Massachusetts
Boston, MA	Boston, MA

* Pursuant to 40 C.F.R. 124.15(b)(3), if no comments requesting a change to the draft permit modification are received, the permit modification will become effective upon the date of signature.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated process water through **Outfall Serial Number 001** to the North River. Such discharge shall be limited and monitored by the Permittee as specified below:

Effluent Characteristic	**Discharge Limitation**		**Monitoring Requirements[1,2]**	
	Average Monthly	**Maximum Daily**	**Measurement Frequency[3,4]**	**Sample Type**
Flow Rate [5]	Report MGD	0.89 MGD	Continuous	Recorder
pH [6]	6.5 - 9.0 SU		1/day	Grab
Production Rate [7]	Report	Report	1/day	Estimate
BOD_5	292 lbs/day	510 lbs/day	1/month	Composite [8]
Total Suspended Solids (TSS)	350 lbs/day	510 lbs/day	1/month	Composite [8]
COD	3640 lbs/day	7280 lbs/day	1/quarter	Composite [8]
Sulfide, Total	1.0 lb/day	2.0 lbs/day	1/quarter	Grab
Chromium, Total	Report lbs/day	1.1 lbs/day	1/year	Composite [8]
Phenols, Total	Report lbs/day	1.0 lb/day	1/quarter	Grab
Ammonia-Nitrogen (as N)	Report mg/l and lbs/day	Report mg/l and lbs/day	1/quarter	Composite [8]
Total Kjeldahl Nitrogen (TKN)	Report mg/l and lbs/day	Report mg/l and lbs/day	2/month	Composite [8]
Nitrite-Nitrate (as N)	Report mg/l and lbs/day	Report mg/l and lbs/day	2/month	Composite [8]
Total Nitrogen	Report lbs/day	Report lbs/day	2/month	Composite [8]
Total Phosphorus (May – October) [9]	Report/1.26mg/l	Report mg/l	1/month	Composite [8]
Total Phosphorus (November-April)	Report mg/l	Report mg/l	1/month	Composite [8]
E. Coli (April 1 – October 31)	126 cfu/100 ml	409 cfu/100 ml	1/week	Grab
Copper, Total [9]	Report /22 µg/l	Report/ 22 µg/l	1/month	Composite [8]
Temperature	Report ^{o}F	Report ^{o}F	1/month	Grab

See pages 5 and 6 for footnotes

CONTINUED FROM PREVIOUS PAGE

Effluent Characteristic	Discharge Limitation	Monitoring Requirements[1,2]	
	Maximum Daily	Measurement Frequency[3,4]	Sample Type
Whole Effluent Toxicity [10,11,12]			
LC_{50}	$\geq$ 100 %	1/quarter	Composite [8]
C-NOEC [9]	$\geq$ 5 %, $\geq$ 7.2 %	1/quarter	Composite [8]
Hardness	Report mg/L	1/quarter	Composite [8]
Total Residual Chlorine	Report mg/L	1/quarter	Grab
Alkalinity	Report mg/L	1/quarter	Composite [8]
pH	Report SU	1/quarter	Grab
Specific Conductance	Report µmhos/cm	1/quarter	Composite [8]
Total Solids	Report mg/L	1/quarter	Composite [8]
Ammonia	Report mg/L	1/quarter	Composite [8]
Total Organic Carbon	Report mg/L	1/quarter	Composite [8]
Cadmium, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Lead, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Copper, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Zinc, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Nickel, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Aluminum, Total Recoverable	Report mg/L	1/quarter	Composite [8]
Total Dissolved Solids	Report mg/L	1/quarter	Composite [8]

See pages 5 and 6 for footnotes

CONTINUED FROM PREVIOUS PAGE

During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated process water through **Outfall Serial Number 001** to the North River. The three (3) samples taken from the North River, considered to be the receiving water control, shall be monitored by the Permittee as specified below as required by the Whole Effluent Toxicity testing requirement.

Ambient Characteristic[11]	**Ambient Reporting Requirements**	**Monitoring Requirements[1,2]**	
	Maximum Daily	**Measurement Frequency[3,4]**	**Sample Type**
Hardness	Report mg/L	1/quarter	Grab
Alkalinity	Report mg/L	1/quarter	Grab
pH	Report SU	1/quarter	Grab
Specific Conductance	Report µmhos/cm	1/quarter	Grab
Ammonia	Report mg/L	1/quarter	Grab
Total Organic Carbon	Report mg/L	1/quarter	Grab
Cadmium, Total Recoverable	Report mg/L	1/quarter	Grab
Lead, Total Recoverable	Report mg/L	1/quarter	Grab
Copper, Total Recoverable	Report mg/L	1/quarter	Grab
Zinc, Total Recoverable	Report mg/L	1/quarter	Grab
Nickel, Total Recoverable	Report mg/L	1/quarter	Grab
Aluminum, Total Recoverable	Report mg/L	1/quarter	Grab

See pages 5 and 6 for footnotes

Footnotes:

1. The samples for Outfall 001 shall be collected at the discharge point to the North River. Samples shall be taken at a consistent location(s) and consistent times which yield data representative of the process water effluent just prior to discharge to the North River and prior to comingling with any non-process waters, if such comingling occurs. Changes in sampling location must be approved in writing by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP).

2. In accordance with 40 C.F.R. § 122.44(i)(1)(iv), the Permittee shall use sufficiently sensitive test procedures (i.e., methods) approved under 40 C.F.R. Part 136 or required under 40 C.F.R. Chapter I, Subchapter N or O, for the analysis of pollutants or pollutant parameters limited in this permit (except WET limits). A method is considered "sufficiently sensitive" when either (1) the method minimum level (ML) is at or below the level of the effluent limit established in this permit for the measured pollutant or pollutant parameter; or (2) the method has the lowest ML of the analytical methods approved under 40 C.F.R. Part 136 or required under 40 C.F.R. Chapter I, Subchapter N or O for the measured pollutant or pollutant parameter. The ML is not the minimum level of detection, but rather the lowest level at which the test equipment produces a recognizable signal and acceptable calibration point for a pollutant or pollutant parameter, representative of the lowest concentration at which a pollutant or pollutant parameter can be measured with a known level of confidence. For the purposes of this permit, the detection limit (DL) is the lowest concentration that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method during routine laboratory operating conditions (i.e., the level above which an actual value is reported for an analyte, and the level below which an analyte is reported as non-detect).

3. Measurement frequency of 1/day is defined as the recording of one measurement for each 24 hour period. Measurement frequency of 1/week is defined as the sampling of one discharge event in each seven-day period. Measurement frequency of 1/month is defined as the sampling of one discharge event in each calendar month. Measurement frequency of 1/year is defined as the sampling of one discharge event which occurs during the month of May. Quarterly samples shall be collected during the second weeks in January, April, July, and October.

4. The Permittee shall submit the results to EPA of any additional testing done above that which is required herein, if it is in accordance with EPA approved methods. If no sampling result can be reported during one or more of the measurement frequencies defined above, the Permittee must report the appropriate No Data Indicator Code (e.g., "C" for "No Discharge") found in Attachment E of *NPDES Permit Program Instructions for the Discharge Monitoring Report Forms (DMRs).*

5. Flow rate shall be reported in million gallons per day (MGD). The flow shall be continuously measured and recorded using a flow meter. The total flow for each operating date shall be recorded and attached to each monthly DMR form.

6. The pH of the effluent shall be not less than 6.5 or greater than 9.0 standard units (s.u.) but not more than 0.5 standard units outside of the naturally occurring range. There shall be no change from natural background conditions that would impair any use assigned to the class of the receiving water.

7. Total production rate of finished goods in pounds per day.

8. A 24-hour composite shall consist of twenty-four (24) grab samples collected at hourly intervals during a twenty-four hour period (i.e., 0700 Monday to 0700 Tuesday), combined proportionally to flow.

9. For the parameters total copper and total phosphorus (May through October), there will be a monitor only requirement for the period starting on the effective date of this permit and ending three (3) years after the effective date. This is consistent with the three (3) year compliance schedule outlined in Part I.B.4 of the final permit. After this 3 year period, the permittee shall comply with the monthly average and daily maximum total copper limits of 22 µg/l as well as the seasonal, monthly average total phosphorus limit of 1.26 mg/l. For the chronic-no observed effect concentration (C-NOEC), the prior permit limit of $\geq$ 5% will be in effect for the first three (3) years of the permit as specified above in this footnote. After this 3 year period, the revised limit of $\geq$ 7.2 % will go into effect. See Part I.B.4 for additional requirements regarding the compliance schedule **and Part I.B.5 for copper reopener clause**.

10. The Permittee shall conduct chronic whole effluent toxicity (WET) tests once per calendar quarter following the effective date of the permit. The tests must be performed in accordance with test procedures and protocols specified in Attachment A of this permit using the daphnid, *Ceriodaphnia dubia*. LC_{50} and C-NOEC are defined in Part II.E.3 of this permit. WET test samples shall be collected during the months of January, April, July, and October and the test results shall be submitted with the discharge monitoring reports (DMRs), no later than the 15th day of the month following the completed reporting period. For example, the WET test results for January shall be submitted with the February DMR, no later than March 15th.

WET Testing Months	Submit Results by:	Test Species	Chronic Limit	Acute Limit
January April July October	March 15th June 15th September 15th December 15th	*Ceriodaphnia dubia* (daphnid)	C-NOEC $\geq$ 7.2%	$LC_{50} \geq$ 100%

11. The Permittee shall conduct the analyses specified in Attachment A, Part VI. CHEMICAL ANALYSIS, of this permit. **For 100% effluent**, the Permittee shall report results for the parameters listed on Page 3, Part I.A., Whole Effluent Toxicity, hardness through total dissolved solids, inclusive. The dilution water sample for the WET tests shall be **a receiving water control** (i.e., 0% effluent) consisting of three grab samples (defined in Part II.E.) collected from the North River at a point immediately upstream, outside of Outfall 001's zone of influence at a reasonably accessible location and taken over a 1-hour period. For this receiving water control, the Permittee shall report results for the parameters listed on Page 4. Even where an alternate dilution water is permitted, the receiving water control (0% effluent) must still be analyzed. MLs and methods are specified in Attachment A., Part VI. CHEMICAL ANALYSIS. Sampling for any parameter required for WET may be used to satisfy any duplicative sampling required for that parameter in this permit, so long as the timing of sampling for WET coincides with the sample timing otherwise required for that parameter within this permit.

12. If the toxicity test uses receiving water as diluent and the receiving water is found to be toxic or unreliable, the permittee shall follow procedures outlined in Section IV (Dilution Water) of Attachment A in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required in Attachment A, EPA-New England has developed a Self-Implementing Alternative Dilution Water Guidance document (called "Guidance Document") which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance document may be found at: https://www3.epa.gov/region1/npdes/permits/generic/Alternatedilutionwaterguidance.pdf.
If this Guidance Document is revoked, the permittee shall revert to obtaining approval as outlined in Attachment A. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in Attachment A.

Part I.A. continued.

2. The discharge shall not cause a violation of the water quality standards of the receiving waters.

3. The discharge shall not contain floating, suspended and settleable solids, oil and grease, petrochemicals and other volatile or synthetic organic pollutants.

4. The discharge shall not produce objectionable odor, color, taste, or turbidity.

5. The discharge shall not contain pollutants in concentrations or combinations or cause alterations that impair the existing uses of the receiving water, or interfere with the attainment of designated uses in the receiving water or downstream and adjacent waterbody segments.

6. The discharge shall not contain pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

7. The Permittee shall properly operate and maintain the pollution control equipment.

8. The Permittee shall implement preventative maintenance procedures for the pollution control equipment.

9. The Permittee shall implement procedures and maintenance schedule for removal and disposal of solids and/or sludge.

10. The permittee shall not use fungicides or slimicides containing trichlorophenol or pentachlorophenol.

11. Any intake water that is used solely for cooling purposes shall not be directly returned to the receiving water.

12. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe (40 C.F.R. §122.42):

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

i. 100 micrograms per liter (µg/L);

ii. 200 µg/L for acrolein and acrylonitrite; 500 µg/L for 2,4-dinitrophenol; and one milligram per liter (mg/L) for antimony;

iii. Five times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or

iv. Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f) and Massachusetts regulations.

b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

i. 500 µg/L;
ii. One mg/L for antimony;
iii. 10 times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or
iv. Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f) and Massachusetts regulations.

13. This permit may be modified in accordance with 40 C.F.R. Section 122.62(a)(3) if the standards or regulations on which the permit is based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit is issued in accordance with 40 C.F.R. Section 122.62(a)(3).

B. SPECIAL CONDITIONS

1. Best Management Practices (BMP) Plan

The permittee shall continue to implement and maintain a Best Management Practices (BMP) Plan designed to reduce or prevent the discharge of pollutants in process water to waters of the United States. The BMP Plan shall be a written document that is consistent with the terms of the permit and identifies and describes the BMPs employed by the facility in operating process water controls.

Within six months following the effective date of the permit, the Permittee shall update and certify that the BMP Plan meets the requirements of this permit, and that it reduces the pollutants discharged in process water to the extent practicable. The BMP Plan and certification shall be signed in accordance with the requirements identified in 40 C.F.R. §122.22. A copy of the BMP Plan and certification shall be maintained at the Permittee's facility and made available to EPA and MassDEP upon request.

The permittee shall amend and update the BMP Plan **within thirty (30) days** for any changes at the facility affecting the BMP Plan. Such changes may include, but are not limited to, changes in the design, construction, operation, or maintenance of the facility, which have a significant effect on the potential for the discharge of pollutants to the waters of the United States. The amended BMP Plan shall be certified as described above.

The permittee shall certify at least annually that the facility is in compliance with the requirements of the BMP Plan. If the facility is not in compliance with any aspect of the BMP Plan, the annual certification shall state the noncompliance (e.g., a selected BMP is not achieving the control necessary to meet a numeric or non-numeric effluent limitation) and the actions which were undertaken to remedy such noncompliance (e.g., the selection, design and implementation of an alternate BMP). Such annual certifications shall be signed, maintained at the facility, and made available to EPA and MassDEP as described above.

The BMP Plan shall include, at a minimum, the following items:

a. Selection, design, installation, implementation and maintenance of control measures necessary to meet the effluent limitations in this permit, including the non-numeric limitations and conditions in Part I.A. Any control measures shall be used in accordance with good engineering practices and manufacturer's specifications.

b. A description of the pollution control equipment and procedures used to minimize the discharge of suspended solids, floating solids, foam/scum/debris, visible oil sheen, and settleable solids to surface waters.

c. Preventative maintenance procedures for the pollution control equipment.

d. Procedures for handling facility wastes, including schedules for removal, handling and disposal of materials, a description of where solids removed from the pollution control equipment or appurtenances, including sludge, are stored and/or disposed of, and the control measures used to prevent the removed solids from reentering the receiving water. If facility wastes are removed from the site, describe the destination and the method of disposal and/or reuse.

e. A record of the following information for all chemicals and additives used at the facility, including all chemicals used in the treatment processes at the facility (flocculation, clarification, filtration, and disinfection), and for control of biological growth, and corrosion and scale in water pipes:

i. Product name, chemical formula, and manufacturer of the additive;
ii. Purpose or use of the additive;
iii. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each additive;
iv. The frequency (e.g., hourly, daily), duration (e.g., hours, days), quantity (e.g., maximum and average), and method of application for the additive; and
v. The vendor's reported aquatic toxicity, when available (NOAEL and/or LC50 in percent for aquatic organism(s)).

f. A description of the training to be provided for employees to assure they understand the goals, objectives, and procedures of the BMP Plan, the requirements of the NPDES Permit, and their individual responsibilities for complying with the goals and objectives of the BMP Plan and the NPDES permit.

g. Minimum documentation requirements are as follows:

i. Records of operational and preventive maintenance activities, equipment inspections, procedure audits, and personnel training;
ii. Records of the collection and analysis of samples, including, but not limited to, sample location, any calculations done at the time of sampling, any sampling or analytical methods used for samples analyzed on site, and sample results; and
iii. All documentation of BMP Plan activities shall be kept at the facility and provided to EPA or MassDEP upon request.

2. Treatment Plant Optimization for Nitrogen

The permittee shall complete an evaluation of alternative methods of operating its existing wastewater treatment facility to optimize the removal of nitrogen, and submit a report to EPA and MassDEP documenting this evaluation. This report shall present a description of recommended operational changes within one (1) year of the effective date of the permit. The permittee shall implement the recommended operational changes in order to maintain the existing mass discharge loading of total nitrogen, which will be measured as an annual average. The annual average total nitrogen load from this facility (for the period of March 2011 – March 2016) is estimated to be 67.3 lbs/day. The permittee shall submit an annual report due by January 15th of each year and submitted with the December DMR that summarizes activities related to optimizing the effectiveness of nitrogen removal methods. The report shall also include documentation of the annual nitrogen discharge load from the facility and how that load compares to previous years.

3. Whole Effluent Toxicity (WET) Testing Reduction

The Permittee may request a reduction in Whole Effluent Toxicity testing requirements by submitting results for a minimum of four (4) consecutive tests, all of which must be valid tests that demonstrate compliance with the WET testing requirements in this permit. Until written notice is received from EPA indicating that the WET testing requirements have been changed, the Permittee is required to continue testing as specified in this permit.

4. Compliance Schedule

The Permittee shall have up to three (3) years to comply with the new effluent limits for total copper and seasonal total phosphorus, and the more stringent C-NOEC limit. For the period starting on the effective date of this permit and ending three (3) years after the effective date, the permittee is required to monitor only and report monthly for total copper and total phosphorus for the seasonal period of May through October. After this initial three (3) year period, the permittee shall comply with the monthly average and daily maximum total copper limits of 22 µg/l as well as the seasonal, monthly average total phosphorus limit of 1.26 mg/l. For the chronic-no observed effect concentration (C-NOEC), the limit of $\geq$ 5% will be in effect for the first three (3) years of the permit. After this three (3) year period, the revised limit of $\geq$ 7.2 % will go into effect.

The permittee shall submit an annual report due by January 15th of each of the first three (3) years of the permit which will detail its progress towards meeting the final permit limits for the parameters listed above. This annual report shall be submitted with the December DMR.

5. Reopener Clause for Total Copper Limit

If within three (3) years of the effective date of the permit, MassDEP has promulgated a site specific copper water quality criterion for the North River, or the Permittee has submitted to MassDEP site specific study data to support a determination of such a site specific copper water quality criterion, the Permittee may request a Permit Modification to extend the compliance period for attaining the effluent limit for total copper beyond the original three (3) year period.

C. REPORTING REQUIREMENTS

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 C.F.R. Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to EPA and the MassDEP within the time frames specified within the permit.

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

The permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and MassDEP no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or MassDEP.

2. Submittal of Reports as NetDMR Attachments

Unless otherwise specified in this permit, the permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. Permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP. (See Part I.C.5 for more information on state reporting.) Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the particular report due date specified in this permit.

3. Submittal of Requests and Reports to EPA/OEP

The following requests, reports, and information described in this permit shall be submitted to the EPA/OEP NPDES Applications Coordinator in the EPA Office Ecosystem Protection (OEP).

A. Transfer of permit notice
B. Request for changes in sampling location
C. Request for reduction in testing frequency
D. Request for reduction in WET testing requirement
E. Report on unacceptable dilution water / request for alternative dilution water for WET testing
F. Notification of proposal to add or replace chemicals additives and bio-remedial agents including microbes
G. Evaluation of Alternative Methods for Nitrogen Removal Report
H. Annual Nitrogen Removal Optimization Reports
I. Annual Compliance Schedule Reports for Copper, Phosphorus, and WET

These reports, information, and requests shall be submitted to EPA/OEP electronically at R1NPDES.Notices.OEP@epa.gov or by hard copy mail to the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP NPDES Applications Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

4. Submittal of Reports in Hard Copy Form

The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to EPA.

A. Written notifications required under Part II
B. Notice of unauthorized discharges

This information shall be submitted to EPA/OES at the following address:

U.S. Environmental Protection Agency
Office of Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-SMR)
Boston, MA 02109-3912

5. State Reporting

Transfer or termination of permit notices shall be submitted to:

MassDEP
Bureau of Water Resources
Wastewater Management Program
1 Winter Street, 5th Floor
Boston, MA 02108

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.C.3 and I.C.4 shall also be submitted to the State at the following addresses:

MassDEP – Western Region
Bureau of Water Resources
436 Dwight Street, Suite 402
Springfield, MA 01103

Except that, copies of toxicity tests and annual nitrogen optimization reports shall be submitted to:

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

6. Verbal Reports and Verbal Notifications

Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to MassDEP. This includes verbal reports and notifications which require reporting within 24 hours. (As examples, see Part II.B.4.c. (2), Part II.B.5.c. (3), and Part II.D.1.e.) Verbal reports and verbal notifications shall be made to EPA's Office of Environmental Stewardship at: **617-918-1510**

D. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 C.M.R. 3.19, are hereby incorporated by reference into this state surface water discharge permit.

2. This authorization also incorporates the state water quality certification issued by MassDEP under §401(a) of the Federal Clean Water Act, 40 CFR 124.53, M.G.L. c. 21, §27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

3. Each Agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of this permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared, invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as an NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of Federal law, this permit shall remain in full force and effect under State law as a permit issued by the Commonwealth of Massachusetts.

FRESHWATER CHRONIC
TOXICITY TEST PROCEDURE AND PROTOCOL
USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic toxicity data shall be reported as outlined in Section VIII.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6^{o} C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code OES04-4
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥3 standard deviations for IC25 values and ≥ two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids[6]	x		--
Total Dissolved Solids[6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon[6]	x	x	0.5
Total Metals[5]			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 2340B (hardness by calculation)
  -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 4500-CL E Low Level Amperometric Titration
  -Method 4500-CL G DPD Colorimetric Method
- USEPA 1983. Manual of Methods Analysis of Water and Wastes
  -Method 330.5

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at http://water.epa.gov/scitech/methods/cwa/ . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value**,** for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.

- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater that the PMSD lower bound, then the treatment is considered statistically significant.

- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
  - Facility name
  - NPDES permit number
  - Outfall number
  - Sample type
  - Sampling method
  - Effluent TRC concentration
  - Dilution water used
  - Receiving water name and sampling location
  - Test type and species
  - Test start date
  - Effluent concentrations tested (%) and permit limit concentration
  - Applicable reference toxicity test date and whether acceptable or not
  - Age, age range and source of test organisms used for testing
  - Results of TAC review for all applicable controls
  - Test sensitivity evaluation results (test PMSD for growth and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

NPDES PART II STANDARD CONDITIONS
(January, 2007)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

Note: See 40 CFR §122.41(a)(2) for complete “Duty to Comply” regulations.

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this permit.

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including "sludge-only facilities"), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or permittee;
(2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).

c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Paragraphs B.4.c. and 4.d. of this section.

c. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
(3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.
ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. Upset

a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated;
(3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
(4) The permittee complied with any remedial measures required under B.3. above.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by

imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The permittee shall allow the Regional Administrator or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. Planned Changes. The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
(2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. Anticipated noncompliance. The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. Transfers. This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

incorporate such other requirements as may be necessary under the CWA. (See 40 CFR Part 122.61; in some cases, modification or revocation and reissuance is mandatory.)

d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. Twenty-four hour reporting.

(1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

(3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.

h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and Federal standards and limitations to which a “discharge”, a “sewage sludge use or disposal practice”, or a related activity is subject to, including “effluent limitations”, water quality standards, standards of performance, toxic effluent standards or prohibitions, “best management practices”, pretreatment standards, and “standards for sewage sludge use and disposal” under Sections 301, 302, 303, 304, 306, 307, 308, 403, and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in "approved States", including any approved modifications or revisions.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" measured during the calendar week divided by the number of "daily discharges" measured during the week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

(a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.

(c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

(d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the calendar day or any other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source", or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation (See "Point Source" definition).

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead

to a treatment works; and discharges through pipes, sewers, or other conveyances leading into privately owned treatment works.

This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Regional Administrator on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States", the waters of the "contiguous zone", or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under Section 304(b) of CWA to adopt or revise "effluent limitations".

EPA means the United States "Environmental Protection Agency".

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized

populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable "daily discharge" concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as "maximum concentration" or "Instantaneous Maximum Concentration" during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean "a value that shall not be exceeded" during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of "Maximum Daily Discharge" and "Average Daily Discharge" concentrations are specifically limited to the daily (24-hour duration) values.

Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribe organization, or a designated and approved management agency under Section 208 of the CWA.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program".

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants";

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source"; and

(d) Which has never received a finally effective NPDES permit for discharges at that "site".

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore rig or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR §§125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants", the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System".

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved" State.

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR §122.2).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D. D.C. 1979)); also listed in Appendix A of 40 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (b) not a "POTW".

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly Owned Treatment Works (POTW) means any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary Industry Category means any industry which is not a "primary industry category".

Section 313 water priority chemical means a chemical or chemical category which:

(1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);

(2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and

(3) satisfies at least one of the following criteria:

(i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
(ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
(iii) are pollutants for which EPA has published acute or chronic water quality criteria.

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets, raw materials used in food processing or production, hazardous substance designated under section 101(14) of CERCLA, any chemical the facility is required to report pursuant to EPCRA Section 313, fertilizers, pesticides, and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to Section 405(d) of the CWA, and is required to obtain a permit under 40 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants means any pollutant listed as toxic under Section 307 (a)(1) or, in the case of "sludge use or disposal practices" any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and wastewater from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a "treatment works treating domestic sewage", where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503.

Waste Pile means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

(1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

(2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 122.2,

classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved state programs, the Regional Administrator in conjunction with the State Director, because of the potential for sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Industrial wastewater is wastewater generated in a commercial or industrial process.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

Municipality means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management agency under section 208 of the CWA, as amended. The definition includes a special district created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is an individual, association, partnership, corporation, municipality, State or Federal Agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination or organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to:, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
ug/l	Microgram(s) per liter
WET	"Whole effluent toxicity" is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	"Chronic (Long-term Exposure Test) – No Observed Effect Concentration". The highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.
A-NOEC	"Acute (Short-term Exposure Test) – No Observed Effect Concentration" (see C-NOEC definition).
LC_{50}	LC_{50} is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

STATEMENT OF BASIS FOR:

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT
MODIFICATION TO DISCHARGE TO WATERS OF THE UNITED STATES

NPDES PERMIT NO.: **MA0003697**

PUBLIC NOTICE START AND END DATES: January 18, 2018 – February 16, 2018

NAME OF APPLICANT:

Barnhardt Manufacturing Company

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Barnhardt Manufacturing Company
247 Main Road
Colrain, MA 01340

RECEIVING WATERS: **North River (Deerfield River Watershed)**

CLASSIFICATION: **B**

1.0 PROPOSED ACTION

On September 19, 2017, Region 1 of the U.S. Environmental Protection Agency ("Region") and the Massachusetts Department of Environmental Protection issued an NPDES Permit ("Final Permit") to Barnhardt Manufacturing Company ("BMC" or "Permittee") for discharges from its manufacturing facility in Colrain, MA. The discharge authorized by NPDES Permit MA0003697 is directed to the North River via Outfall 001.

This statement of basis explains a major modification to the Final NPDES Permit pursuant to federal regulations found at 40 C.F.R. §122.62. The modification consists of the addition of a permit reopener clause as Part I.B.5 of the permit. This reopener clause would allow the Permittee to request a Permit Modification to extend the compliance period for attaining the effluent limit for total copper beyond the original three (3) year period. This request would be contingent upon the Permittee submitting to MassDEP site specific study data to support a determination of such a site specific copper water quality criterion or the MassDEP promulgating a site specific water quality criterion for copper for the North River. Either of these actions would need to have been completed within three (3) years of the effective date of the Final Permit. In addition, footnote 9 on Page 6 of the Permit, pertaining to the compliance schedule for complying with the total coper limit, has added a reference to the reopener clause in Part I.B.5.

2.0 BASIS OF PERMIT MODIFICATION

Addition of Permit Reopener Clause for the Total Copper Effluent Limit in Part I.A.1

In the Final Permit, EPA allowed for a period of three (3) years for the permittee to come into compliance with the water quality-based total copper limit of 22 ug/l, expressed as a monthly average and daily maximum limit. This is the time period that the Permittee had requested in its comments on the Draft Permit.

In its comments on the Draft Permit, the Permittee noted that it will seek to collect site specific data in support of its request for the determination of a site specific copper criterion for the North River. EPA acknowledges that the development of this site specific criterion may take more than three (3) years. This process includes the collection and submittal of data by the Permittee, a review of this data by the MassDEP, the potential promulgation of a site specific criterion for copper for the North River, and the eventual approval of this criterion by EPA. In light of the possibility that this process is ongoing as the end of the three (3) year compliance period approaches, EPA believes that it is warranted to include a reopener clause in this Draft Permit Modification to allow the Permittee to request additional time for the development of this site specific criterion, if necessary.

In its comments on the Draft Permit, the Permittee stated that it would also seek to evaluate suitable means and methods for compliance with the final copper limit, which would include an evaluation of manufacturing process changes that may reduce the concentration of copper in the effluent as well as the design, construction and start-up of treatment operations at the facility, if required. Since the development of a site specific copper criterion for the North River is not assured, EPA encourages the Permittee to explore ways to reduce the effluent copper levels at its facility upon the effective date of this Permit Modification, while also collecting data and seeking the determination of a site specific criterion from the MassDEP.

3.0 STATE CERTIFICATION

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations contained in the Draft Permit Modification are stringent enough to assure that the discharge will not cause the receiving water to violate the State WQSs or it is deemed that the state has waived its right to certify. Regulations governing state certification are set forth in 40 C.F.R. § 124.53 and § 124.55. EPA has requested permit certification by the State pursuant to 40 C.F.R. § 124.53 and expects that the Draft Permit Modification will be certified.

If the State believes that any conditions more stringent than those contained in the Draft Permit Modification are necessary to meet the requirements of either the CWA §§ 208(e), 301, 302, 303, 306 and 307, and with appropriate requirements of State law, the State should include such conditions and, in each case, cite the CWA or State law reference upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition. The only exception to this is that the sludge conditions/requirements implementing § 405(d) of the CWA are not subject to the § 401 State Certification requirements. Reviews and appeals of limitations and conditions attributable to State Certification shall be made through the applicable procedures of the State and may not be made through the applicable procedures of 40 C.F.R. § 124.

In addition, the State should provide a statement of the extent to which any condition of the Draft Permit Modification can be made less stringent without violating the requirements of State law. Since the State's certification is provided prior to permit issuance, any failure by the State to provide this statement waives the State's right to certify or object to any less stringent condition.

It should be noted that under CWA § 401, EPA's duty to defer to considerations of state law is intended to prevent EPA from relaxing any requirements, limitations or conditions imposed by state law. Therefore, "[a] State may not condition or deny a certification on the grounds that State law allows a less stringent permit condition." *See* 40 C.F.R. § 124.55(c). In such an instance, the regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." *Id.* EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 C.F.R. § 122.4(d) and 40 C.F.R. § 122.44(d).

4.0 ADMINISTRATIVE RECORD, PUBLIC COMMENT PERIOD, HEARING REQUESTS, AND PROCEDURES FOR FINAL DECISION

All persons, including applicants, who believe any condition of the Draft Permit Modification is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to: George Papadopoulos, U.S. EPA, Office of Ecosystem Protection, Industrial Permits Section, 5 Post Office Square, Suite 100 (OEP06-1), Boston, Massachusetts 02109-3912; or to: Papadopoulos.george@epa.gov.

Any person, prior to such date, may submit a request in writing for a public hearing to consider the Draft Permit Modification to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public meeting may be held if the criteria stated in 40 C.F.R. §124.12 are satisfied. In reaching a decision on the Final Permit Modification, EPA will respond to all significant comments and make these responses available to the public on EPA's website and at EPA's Boston office.

Following the close of the comment period, and after any public hearings, if such hearings are held, the EPA will issue a decision regarding the proposed permit modification and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30 days following the notice of the final permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. §124.19 and/or submit a request for an adjudicatory hearing to MassDEP's Office of Appeals and Dispute Resolution consistent with 310 CMR 1.00.

5.0 EPA & MASSDEP CONTACTS

Additional information concerning the Draft Permit Modification may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays, from the EPA and MassDEP contacts below:

George Papadopoulos, Industrial Permits Section
5 Post Office Square - Suite 100 - Mailcode OEP 06-1
Boston, MA 02109-3912
Email: papadopoulos.george@epa.gov
Telephone: (617) 918-1579; FAX: (617) 918-1505

Xiaodan Ruan, MassDEP
Division of Wastewater Management
Surface Water Discharge Permit Program
1 Winter Street, 5th Floor
Boston, Massachusetts 02108
Email: xiaodan.ruan@state.ma.us;
Telephone: (617) 654-6517; FAX: (617) 292-5696

1/9/18
Date

Ken Moraff, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ECOSYSTEM PROTECTION
REGION I
BOSTON, MASSACHUSETTS 02109

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT MODIFICATION TO DISCHARGE INTO THE WATERS OF THE UNITED STATES UNDER SECTION 301, 316(a), AND 402 OF THE CLEAN WATER ACT (THE "ACT"), AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE ACT.

DATE OF PUBLIC COMMENT PERIOD: January 18, 2018 – February 16, 2018

PERMIT NUMBER: **MA0003697**

PUBLIC NOTICE NUMBER: MA-008-18

NAME AND MAILING ADDRESS OF PERMITTEE:

Barnhardt Manufacturing Company
P.O. Box 3
Colrain, MA 01340

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Barnhardt Manufacturing Company
247 Main Road
Colrain, MA 01340

RECEIVING WATER: **North River (Deerfield River Watershed), Class B water**

PREPARATION OF THE DRAFT PERMIT MODIFICATION:

The U.S. Environmental Protection Agency ("EPA") and the Massachusetts Department of Environmental Protection ("MassDEP") have cooperated in the development of a draft permit modification for the above identified facility. The effluent limits and permit conditions imposed have been drafted to assure compliance with the Clean Water Act ("CWA"), 33 U.S.C. sections 1251 et seq.,, the Massachusetts Clean Waters Act, G.L. c. 21, §§ 26-53, 314 CMR 3.00 and State Surface Water Quality Standards at 314 CMR 4.00.

INFORMATION ABOUT THE DRAFT PERMIT MODIFICATION:

A fact sheet or a statement of basis (describing the type of facility; type and quantities of wastes; a brief summary of the basis for the draft permit conditions; and significant factual, legal and policy questions considered in preparing this draft permit modification) and the draft permit modification may be obtained at no cost at: http://www.epa.gov/region1/npdes/draft_permits_listing_ma.html or by writing or calling EPA's contact person named below:

George Papadopoulos, US EPA
5 Post Office Square
Suite 100 (OEP 06-1)
Boston, MA 02109-3912
Telephone: (617) 918-1579

The administrative record containing all documents relating to this draft permit modification is on file and may be inspected at the EPA Boston office mentioned above between 9:00 a.m. and 5:00 p.m., Monday through Friday, except holidays.

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

All persons, including applicants, who believe any condition of this draft permit modification is inappropriate, must raise all issues and submit all available arguments and all supporting material for their arguments in full by February 16, 2018, to the U.S. EPA, George Papadopoulos, 5 Post Office Square, Suite 100, Mailcode OEP 06-1, Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing to EPA and the MassDEP for a public hearing to consider this draft permit modification. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least sixty (60) days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on this draft permit modification the Regional Administrator will respond to all significant comments and make the responses available to the public at EPA's Boston office.

FINAL PERMIT DECISION AND APPEALS:

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30 days following the notice of the final permit decision any interested person may submit petition to the Environmental Appeals Board to reconsider or contest the final decision.

Lealdon Langley, Director
MASACHUSETTS WETLANDS AND
WASTEWATER PROGRAMS
MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION

Ken Moraff, Director
OFFICE OF ECOSYSTEM PROTECTION
ENVIRONMENTAL PROTECTION
AGENCY

ATTACHMENT-2

New England Bioassay Inc.

Aquatic Toxicity Testing Services

77 Batson Drive
Manchester, CT 06042
(860)-643-9560
www.nebio.com

CHRONIC AQUATIC TOXICITY TEST REPORT

Permitee: Barnhardt Manufacturing Co. NPDES # MA0003697
Report submitted to: 247 Main Road
Colrain, MA 01340
Sample ID: Effluent
Test Month/Year: January 2021
NEB Proj # 44654

Test Type / Method: *Ceriodaphnia dubia* Modified Chronic Static-Renewal Freshwater Test Method 1002.0; EPA 821-R-02-013

Effluent Sample Dates: #1 1/10-11/21 #2 1/12-13/21 #3 1/14-15/21

Test Start Date: 1/11/21

Results Summary

Your results were as follows:

Passed all permit limits

Acute Test Results				
Species	LC50	A-NOEC	Permit Limit	Pass / Fail
Ceriodaphnia dubia	>100%	100%	≥ 100%	Pass

Chronic Test Results					
Species	C-NOEC	C-LOEC	IC25	Permit Limit	Pass/Fail
Ceriodaphnia dubia	12.5%	25%	13.6%	≥ 5.0%	Pass

Data Qualifiers affecting this test:

Certifications & Approvals: NH ELAP (2071), NJ DEP (CT405)

Test Report Certification

Permittee name:	Barnhardt Manufacturing Co.	Permit number:	MA0003697
Client sample ID:	Effluent	Test Start Date:	1/11/21

Whole Effluent Toxicity Test Report Certification (Permittee)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: _____ (Date)

_____ Authorized Signature

_____ Print or Type Name and Title

_____ Print or Type the Permittee's Name

MA0003697 Print or Type the NPDES Permit Number

Whole Effluent Toxicity Test Report Certification (Bioassay Laboratory)

The results reported relate only to the samples submitted as received

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: 1/25/21 (Date)

Kimberly Wills

Kimberly Wills
Laboratory Director
New England Bioassay Inc.

General Test Conditions

Permittee name: Barnhardt Manufacturing Co. Permit number: MA0003697

Client sample ID: Effluent Test Start Date: 1/11/21

Sample Collection Information

Effluent #1 Dates/Times: 1/10-11/21 @ 0700-0700 Receiving Water #1 Date/Time: 1/11/21 @ 0630

Effluent #2 Dates/Times: 1/12-13/21 @ 0700-0700 Receiving Water #2 Date/Time: 1/13/21 @ 0630

Effluent #3 Dates/Times: 1/14-15/21 @ 0700-0700 Receiving Water #3 Date/Time: 1/15/21 @ 0630

Were a minimum of three samples collected? Yes ☑ No ☐ *(see note below)

Were samples used within the first 36 hours of collection? Yes ☑ No ☐ * (see note below)

* sample collection note:

Test Conditions

Permittee's Receiving Water: North River

- Dilution water: Receiving water collected at a point immediately upstream of or away from the discharge
- Control water: Connecticut River adjusted to moderate hardness (hardness 80 - 100 mg/L CaCO3)

Effluent concentrations tested: 0%, 5.0%, 6.25%, 12.5%, 25%, 50%, 100%

Was effluent salinity adjusted? No ☑ Yes ☐ with Instant Ocean sea salts to _____ ppt

Dechlorination procedures: Chlorine is measured using 4500 CL-G DPD Colorimetric Method

- Dechlorination was not required

TRC results and further information about aeration of samples can be found attached in "sample receipt chemistry"

Reference Toxicant Data

Ceriodaphnia dubia

Date:	1/4/21
Toxicant:	Sodium chloride
Dilution Water:	NEB CTRMH
Organism Source:	NEB
Reproduction IC25:	1.05 g/L
Results within range	Yes ☑ No ☐

Ceriodaphnia dubia Test Results

Permittee name: Barnhardt Manufacturing Co. Permit number: MA0003697

Client sample ID: Effluent Test Dates: 1/11/21 - 1/17/21

Test Acceptability Criteria

Lab Control Survival:	90	%	Mean Lab Control Reproduction:	28.3	young per female
Diluent Control Survival:	100	%	Mean Diluent Control Reproduction:	28.0	young per female
Thiosulfate Control Survival:	N/A	%	Mean Thiosulfate Control Reproduction:	N/A	young per female

Presence of an asterisk (*) indicates EPA criteria was not met, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Results

		Permit Limit	Test Result	Pass/Fail Status
Acute Data	48 hr LC50	≥ 100%	>100%	Pass
	48 hr NOEC		100%	
	TUa			
Chronic Data	Chronic LC50		100%	
	Survival C-NOEC		100%	
	Survival C-LOEC		>100%	
	Reproduction C-NOEC		12.5%	
	Reproduction C-LOEC		25%	
	Reproduction IC25		13.6%	
	Reproduction IC50		19.7%	
	Reportable C-NOEC	≥ 5.0%	12.5%	Pass
	Reportable C-LOEC		25%	
	MATC		17.7%	
	TUc			

Presence of an asterisk (*) indicates qualified data, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Variability

Reproduction PMSD: 20.5% Upper & Lower EPA bounds: 13 - 47% ☐ Low ☑ Within bounds ☐ High

☐ PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC)

☑ The PMSD falls within the upper (47%) and lower (13%) bounds. Results are reportable.

☐ PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower bound.

- ☐ The RPD values for all concentrations fall below the lower bound. Any differences observed in this test are considered statistically insignificant.
- ☐ Some of the concentrations that were flagged as statistically significant have RPD values that fall below the lower bound. Any differences observed in these concentrations will not be considered statistically significantly decreased from the control.
- ☐ No statistically significant reductions were observed in this test.

Ceriodaphnia dubia Test Results

Permittee name: Barnhardt Manufacturing Co. Permit number: MA0003697

Client sample ID: Effluent Test Dates: 1/11/21 - 1/17/21

Concentration - Response Evaluation

Survival: #1 The concentration - response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)", EPA 821-B-00-004, July 2000: #1 Ideal concentration-response relationship.

Reproduction: #1 The concentration - response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)", EPA 821-B-00-004, July 2000: #1 Ideal concentration-response relationship.

The concentration - response relationship was reviewed and the following determination was made:

Survival	Reproduction	
X	X	Results are reliable and reportable
		Results are anomalous (see explanation below)
		Results are inconclusive - retest (see explanation below)

Results Discussion (if applicable):

TEST METHODS

Ceriodaphnia dubia

Test type:	Modified Chronic Static Renewal Freshwater Test
Test Reference Manual:	EPA-821-R-02-013 "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms"
Test Method:	*Ceriodaphnia dubia* Survival and Reproduction Test - EPA 1002.0
Temperature:	25 ˚C ± 1˚C (Temperatures should not deviate by more than 3˚C during the test) (required)
Light Quality:	Ambient Laboratory Illumination (recommended)
Light Intensity:	10-20 µE/m2/s, or 50-100 ft-c (recommended)
Photoperiod:	16 hours light, 8 hours dark (recommended)
Test chamber size:	30 mL (recommended minimum)
Test solution volume:	15 mL (recommended minimum)
Renewal of Test Solutions:	Daily (required)
Age of Test Organisms:	Less than 24 hours; and all released within a 8-h period (required)
Number of Neonates Per Test Chamber:	1 Assigned using blocking by known parentage (required)
Number of Replicate Test Chambers Per Treatment:	10 (required minimum)
Number of Neonates Per Test Concentration:	10 (required minimum)
Feeding Regime:	Fed 0.1 mL each of YCT and algal suspension per exposure chamber daily. (recommended)
Cleaning:	Use new plastic cups daily (recommended)
Aeration:	None (recommended)
Test Duration:	Until 60% or more of control females have three broods (maximum test duration 8 days) (required)
Endpoints:	Survival and reproduction (required)
Test Acceptability:	80% or greater survival of all control organisms and an average of 15 or more young per surviving female in the control solutions. 60% of surviving control females must produce three broods. (required)
Sampling Requirements:	Minimum of three samples with a maximum holding time of 36 hours before first use. (required)
Sample volume required:	1 L/Day (recommended)

CERIODAPHNIA DUBIA
DATASHEETS & STATISTICAL ANALYSIS

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT:	Barnhardt Manufacturing Co.	*C.dubia* TEST ID #	21-49
ADDRESS:	247 Main Road	CHAIN OF CUSTODY #	C41-1086/87
	Colrain, MA 01340	NEB PROJECT #	44654
PERMITTEE:	Barnhardt Manufacturing Co.	SAMPLE ID:	Effluent
PERMIT NUMBER:	MA0003697		
DILUTION WATER:	North River		

INVERTEBRATES

TEST SET-UP TECHNICIAN:	BT
TEST SPECIES:	*Ceriodaphnia dubia*
NEB LOT #	Cd20(RMH 330)
AGE:	< 24 hours
TEST SOLUTION VOLUME (mls):	15
ORGANISMS PER TEST CHAMBER:	1
ORGANISMS PER CONCENTRATION:	10

LABORATORY CONTROL WATER (CTRMH)

Lot Number	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$
CTR21(MH001)	84	60

	DATE	TIME
TEST START:	1/11/21	1413
TEST END:	1/17/21	1459

COMMENTS: _____

REVIEWED BY: Kimberly Wills DATE: 1/25/21

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340							
NEB PROJECT NUMBER:	44654			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	North River			START DATE:			1/11/21 TIME:	1413
NEB Lab Control	1	2	3	4	5	6	7	Remarks
Tech Initials Initial	KO	AG/KO	CMH	CMH	KO	KF		
Temp °C Initial	24.0	24.6	24.7	24.0	24.2	24.0		
D.O. mg/L Initial	9.7	8.7	8.2	8.4	8.3	8.6		
pH s.u. Initial	7.6	7.2	7.6	7.5	7.6	7.5		
Conductivity µS Initial	375	375	374	356	367	367		
Tech Intials Final	AG/KO	CMH	CMH	BT	KF	KO		
Temp °C Final	24.0	24.0	24.0	24.4	24.0	24.0		
D.O. mg/L Final	8.3	8.3	8.4	8.3	8.3	8.4		
pH s.u. Final	7.4	7.5	7.5	7.8	7.5	7.5		
Conductivity µS Final	379	387	397	375	381	379		
North River Diluent	1	2	3	4	5	6	7	Remarks
Tech Initials Initial	KO	AG/KO	CMH	CMH	KO	KF		
Temp °C Initial	24.0	24.8	24.6	24.5	24.3	24.0		
D.O. mg/L Initial	10.5	9.7	10.5	8.9	24.69.2	8.9		
pH s.u. Initial	7.4	6.9	7.4	7.4	7.5	7.3		
Conductivity µS Initial	96	90	91	89	92	90		
Tech Intials Final	AG/KO	CMH	CMH	BT	KF	KO		
Temp °C Final	24.1	24.0	24.0	24.5	24.0	24.0		
D.O. mg/L Final	8.2	8.1	8.2	8.3	8.2	8.2		
pH s.u. Final	7.4	7.5	7.5	7.7	7.4	7.4		
Conductivity µS Final	112	112	108	103	109	107		
5.0%	1	2	3	4	5	6	7	Remarks
Tech Initials Initial	KO	AG/KO	CMH	CMH	KO	KF		
Temp °C Initial	24.0	24.7	24.6	24.6	24.6	24.0		
D.O. mg/L Initial	10.5	9.4	10.4	9.1	9.9	8.9		
pH s.u. Initial	7.4	7.1	7.4	7.4	7.4	7.4		
Conductivity µS Initial	195	192	181	179	187	189		
Tech Intials Final	AG/KO	CMH	CMH	BT	KF	KO		
Temp °C Final	24.3	24.0	24.0	24.7	24.0	24.0		
D.O. mg/L Final	8.3	8.1	8.2	8.3	8.0	8.1		
pH s.u. Final	7.6	7.5	7.5	7.8	7.5	7.6		
Conductivity µS Final	203	204	193	190	199	199		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340							
NEB PROJECT NUMBER:	44654			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	North River			START DATE:			1/11/21 TIME:	1413
6.25%	1	2	3	4	5	6	7	Remarks
Tech Initials Initial	KO	AG/KO	CMH	CMH	KO	KF		
Temp °C Initial	24.0	24.8	24.5	24.6	24.7	24.0		
D.O. mg/L Initial	10.4	9.4	10.1	9.1	9.9	8.7		
pH s.u. Initial	7.4	7.3	7.4	7.5	7.4	7.6		
Conductivity µS Initial	224	223	210	207	214	215		
Tech Intials Final	AG/KO	CMH	CMH	BT	KF	KO		
Temp °C Final	24.2	24.0	24.0	24.7	24.0	24.0		
D.O. mg/L Final	8.2	8.1	8.2	8.3	8.0	8.1		
pH s.u. Final	7.7	7.6	7.6	7.9	7.6	7.7		
Conductivity µS Final	232	235	229	218	226	226		
12.5%	1	2	3	4	5	6	7	Remarks
Tech Initials Initial	KO	AG/KO	CMH	CMH	KO	KF		
Temp °C Initial	24.0	25.1	24.5	24.6	24.7	24.0		
D.O. mg/L Initial	10.3	9.3	10.0	9.0	9.9	8.7		
pH s.u. Initial	7.6	7.5	7.5	7.7	7.6	7.7		
Conductivity µS Initial	324	329	319	319	337	336		
Tech Intials Final	AG/KO	CMH	CMH	BT	KF	KO		
Temp °C Final	24.4	24.0	24.0	24.9	24.0	24.0		
D.O. mg/L Final	8.3	8.2	8.1	8.3	8.0	8.0		
pH s.u. Final	7.9	7.9	7.8	8.1	7.9	7.9		
Conductivity µS Final	336	347	337	331	347	347		
25%	1	2	3	4	5	6	7	Remarks
Tech Initials Initial	KO	AG/KO	CMH	CMH	KO	KF		
Temp °C Initial	24.0	25.1	24.5	24.6	24.8	24.0		
D.O. mg/L Initial	10.1	9.3	9.9	8.9	9.9	8.7		
pH s.u. Initial	8.0	7.8	7.8	8.0	7.8	8.0		
Conductivity µS Initial	598	593	579	555	572	573		
Tech Intials Final	AG/KO	CMH	CMH	BT	KF	KO		
Temp °C Final	24.5	24.0	24.0	25.0	24.0	24.0		
D.O. mg/L Final	8.3	8.1	8.1	8.2	7.9	8.0		
pH s.u. Final	8.3	8.3	8.3	8.4	8.3	8.3		
Conductivity µS Final	619	622	620	585	620	605		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340							
NEB PROJECT NUMBER:	44654			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	North River			START DATE:			1/11/21 TIME:	1413
50%	1	2	3	4	5	6	7	Remarks
Tech Initials Initial	KO	AG/KO	CMH	CMH	KO	KF		
Temp °C Initial	24.0	24.9	24.5	24.6	24.8	24.0		
D.O. mg/L Initial	9.9	9.2	9.7	8.9	9.8	8.7		
pH s.u. Initial	8.3	8.1	8.0	8.2	8.1	8.2		
Conductivity µS Initial	1,039	1,057	1,005	977	1,063	1,046		
Tech Intials Final	AG/KO	CMH	CMH	BT	KF	KO		
Temp °C Final	24.5	24.0	24.0	25.0	24.0	24.0		
D.O. mg/L Final	8.2	8.1	8.1	8.2	8.0	8.0		
pH s.u. Final	8.6	8.6	8.6	8.7	8.6	8.7		
Conductivity µS Final	1,065	1,107	1,084	1,031	1,118	1,094		
100%	1	2	3	4	5	6	7	Remarks
Tech Initials Initial	KO	AG/KO	CMH	CMH	KO	KF		
Temp °C Initial	24.0	24.6	24.5	24.6	25.5	24.0		
D.O. mg/L Initial	9.6	9.1	8.8	8.8	9.0	8.6		
pH s.u. Initial	8.4	8.3	8.1	8.2	8.2	8.3		
Conductivity µS Initial	1,969	1,975	1,911	1,876	1,966	1,982		
Tech Intials Final	AG/KO	CMH	CMH	BT	KF	KO		
Temp °C Final	24.5	24.0	24.0	24.9	24.0	24.0		
D.O. mg/L Final	8.2	8.1	8.2	8.2	8.0	8.0		
pH s.u. Final	8.9	8.9	8.9	9.0	8.9	8.9		
Conductivity µS Final	2,001	2,034	2,029	1,930	2,022	2,023		

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340				
NEB PROJECT NUMBER:	44654		NEB TEST NUMBER:	21-49	COC # C41-1086/87
TEST ORGANISM:	*Ceriodaphnia dubia*		AGE:	<24 hours	Lot # Cd20(RMH 330)
START DATE:	1/11/21	TIME: 1413	END DATE:	1/17/21	TIME: 1459

Effluent Concentration	Culture Lot#	Cd20(RMH 330)										Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
	Cup #	B2	B3	B4	B5	B6	B11	B12	A8	A9	A10				
	Day Number	Replicate													
		A	B	C	D	E	F	G	H	I	J				
NEB Lab Control	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	BT	
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	KO	
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	CMH	
	3	7	2	6	5	6	6	7	8	7	✓	54	10	CMH	CMH
	4	5	6	9	11	10	9	✓/x	✓	✓	7	57	9	KO	KO
	5	✓	✓	✓	✓	✓	✓	X	12	12	13	37	9	KO	KO
	6	16	14	16	15	14	15	X	15	13	17	135	9	KO	KO
	7														
	totals	28	22	31	31	30	30	7	35	32	37	283	9		MC
North River Diluent		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	3	8	5	4	5	6	8	5	3	✓	47	10		
	4	✓	✓	✓	✓	✓	✓	5	✓	✓	7	12	10		
	5	8	14	7	11	11	8	✓	11	10	8	88	10		
	6	12	19	12	16	14	14	18	15	13	✓	133	10		
	7														
	totals	23	41	24	31	30	28	31	31	26	15	280	10		
5.0%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	5	6	8	6	4	5	7	6	7	5	59	10		
	4	9	8	10	10	5	9	12	✓	8	✓	71	10		
	5	✓/x	✓	1	✓	✓	✓	✓	12	✓	11	24	9		
	6	X	16	14	14	9	13	15	13	12	12	118	9		
	7														
	totals	14	30	33	30	18	27	34	31	27	28	272	9		

Notes: _____

_____

_____

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340		
NEB PROJECT NUMBER:	44654	ORGANISM: *Ceriodaphnia dubia*	START DATE: 1/11/21

Effluent Concentration	Day Number	Replicate										Total Live Young	# Live Adults		
		A	B	C	D	E	F	G	H	I	J				
6.25%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	5	6	6	6	7	8	5	6	2	✓	51	10		
	4	4	6	8	9	✓	7	7	✓	✓	6	47	10		
	5	✓	✓	✓	✓	10	✓	✓	11	4	10	35	10		
	6	19	16	14	13	11	15	15	12	✓/x	13	128	9		
	7														
	totals	28	28	28	28	28	30	27	29	6	29	261	9		
12.5%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	6	3	5	6	5	5	6	6	4	✓	46	10		
	4	8	3	6	9	7	8	9	8	10	4	72	10		
	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	10	10		
	6	17	11	13	12	10	12	8	6	3	2	94	10		
	7														
	totals	31	17	24	27	22	25	23	20	17	16	222	10		
25%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	5	2	4	5	5	4	2	6	✓	37	10		
	4	✓	1	✓	✓	✓	1	8	✓	✓	4	14	10		
	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	6	1	7	✓	6	2	✓/x	7	2	1	2	28	9		
	7														
	totals	5	13	2	10	7	6	19	4	7	6	79	9		
50%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	✓	3	1	✓	✓	1	2	2	1	14	10		
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	5	✓	✓	✓	✓	✓	✓	✓	✓/x	✓	✓	0	9		
	6	✓	✓	✓	✓	✓	5	✓	X	✓	✓	5	9		
	7														
	totals	4	0	3	1	0	5	1	2	2	1	19	9		

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340		
NEB PROJECT NUMBER: 44654	ORGANISM: *Ceriodaphnia dubia*	START DATE:	1/11/21

Effluent Concentration	Day Number	Replicates										Total Live Young	# Live Adults		
		A	B	C	D	E	F	G	H	I	J				
100%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	✓	✓	✓	✓	✓	✓	✓	✓	✓/x	✓	0	9		
	4	✓	✓/x	✓	✓	✓/x	✓	✓	✓	X	✓	0	7		
	5	✓	X	✓	✓	X	✓	✓	✓/x	X	✓	0	6		
	6	✓/x	X	✓	✓	X	✓	✓	X	X	✓	0	5		
	7														
	totals	0	0	0	0	0	0	0	0	0	0	0	5		

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	15-3210-3091	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:57	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	FDDF673BDD486C4FA34ADD87A86BBC2	**Editor ID:**	008-848-998-5
Batch ID:	06-6488-8163	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	11 Jan-21 14:13	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	17 Jan-21 14:59	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	06-1504-5340	**Code:**	24A8D8DC	**Project:**	
Sample Date:	11 Jan-21 07:00	**Material:**	Industrial Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	11 Jan-21 11:10	**CAS (PC):**		**Station:**	
Sample Age:	7h	**Client:**	Barnhardt		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	12.5	25	17.68	8	5.734	20.48%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		5	105	75	3	18	CDF	0.8333	Non-Significant Effect
		6.25	97	75	2	18	CDF	0.5980	Non-Significant Effect
		12.5	78.5	75	3	18	CDF	0.0836	Non-Significant Effect
		25*	56	75	0	18	CDF	0.0005	Significant Effect
		50*	55	75	0	18	CDF	0.0004	Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	28	15	>>	Yes	Passes Criteria
PMSD	0.2048	0.13	0.47	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6244.28	1248.86	5	39.81	<1.0E-05	Significant Effect
Error	1693.9	31.3685	54			
Total	7938.18		59			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	15.89	15.09	0.0072	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9128	0.9459	0.0004	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	28	23.15	32.85	29	15	41	2.145	24.22%	0.00%
5		10	27.2	22.62	31.78	29	14	34	2.026	23.56%	2.86%
6.25		10	26.1	21.01	31.19	28	6	30	2.248	27.24%	6.79%
12.5		10	22.2	18.75	25.65	22.5	16	31	1.526	21.74%	20.71%
25		10	7.9	4.356	11.44	6.5	2	19	1.567	62.71%	71.79%
50		10	1.9	0.7101	3.09	1.5	0	5	0.526	87.54%	93.21%
100		10	0	0	0	0	0	0	0	---	100.00%

Reproduction Detail

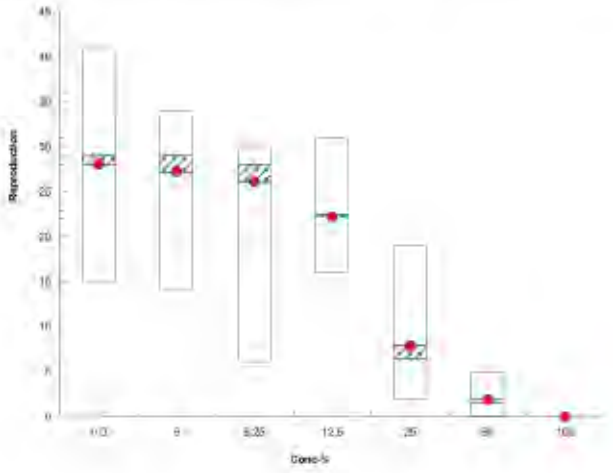
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	23	41	24	31	30	28	31	31	26	15
5		14	30	33	30	18	27	34	31	27	28
6.25		28	28	28	28	28	30	27	29	6	29
12.5		31	17	24	27	22	25	23	20	17	16
25		5	13	2	10	7	6	19	4	7	6
50		4	0	3	1	0	5	1	2	2	1
100		0	0	0	0	0	0	0	0	0	0

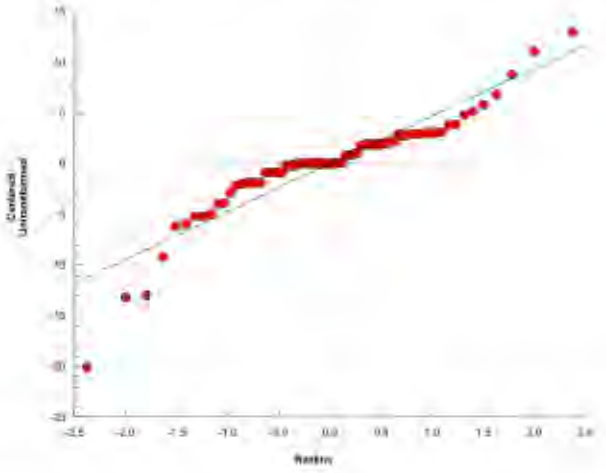
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID:	15-3210-3091	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:57	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	FDDF673BDD486C4FA34ADD87A86BBC2	**Editor ID:**	008-848-998-5

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	15-9136-6314	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.7		
Analyzed:	20 Jan-21 16:56	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1		
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	CAD902082E561DA7BBAA05FD4C303AD	**Editor ID:**	008-848-998-5		
Batch ID:	06-6488-8163	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**			
Start Date:	11 Jan-21 14:13	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water		
Ending Date:	17 Jan-21 14:59	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable		
Test Length:	6d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture	**Age:**	<24
Sample ID:	06-1504-5340	**Code:**	24A8D8DC	**Project:**			
Sample Date:	11 Jan-21 07:00	**Material:**	Industrial Effluent	**Source:**	Barnhardt (BBA Fiberweb)		
Receipt Date:	11 Jan-21 11:10	**CAS (PC):**		**Station:**			
Sample Age:	7h	**Client:**	Barnhardt				

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	431868	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	---	---	<1	---	---

2d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Median**	**Min**	**Max**	**CV%**	**%Effect**	**A/B**	**Mean**	**%Effect**
0	D	10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%

2d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

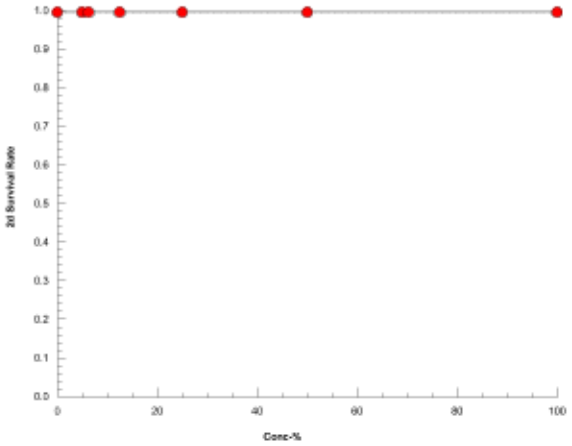
2d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	15-9136-6314	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:56	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	CAD902082E561DA7BBAA05FD4C303AD	**Editor ID:**	008-848-998-5

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	01-8771-0531	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:56	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	A6432040ED3A2D1CD37E6C091BBE3E8	**Editor ID:**	008-848-998-5
Batch ID:	06-6488-8163	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	11 Jan-21 14:13	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	17 Jan-21 14:59	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	06-1504-5340	**Code:**	24A8D8DC	**Project:**	
Sample Date:	11 Jan-21 07:00	**Material:**	Industrial Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	11 Jan-21 11:10	**CAS (PC):**		**Station:**	
Sample Age:	7h	**Client:**	Barnhardt		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1847436	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	100	73.65	---	1	---	1.358

6d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Median**	**Min**	**Max**	**CV%**	**%Effect**	**A/B**	**Mean**	**%Effect**
0	D	10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
5		10	0.9000	1.0000	0.0000	1.0000	35.14%	10.00%	9/10	0.9333	6.67%
6.25		10	0.9000	1.0000	0.0000	1.0000	35.14%	10.00%	9/10	0.9333	6.67%
12.5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	0.9333	6.67%
25		10	0.9000	1.0000	0.0000	1.0000	35.14%	10.00%	9/10	0.9000	10.00%
50		10	0.9000	1.0000	0.0000	1.0000	35.14%	10.00%	9/10	0.9000	10.00%
100		10	0.5000	0.5000	0.0000	1.0000	105.41%	50.00%	5/10	0.5000	50.00%

6d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
100		0.0000	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000	0.0000	1.0000

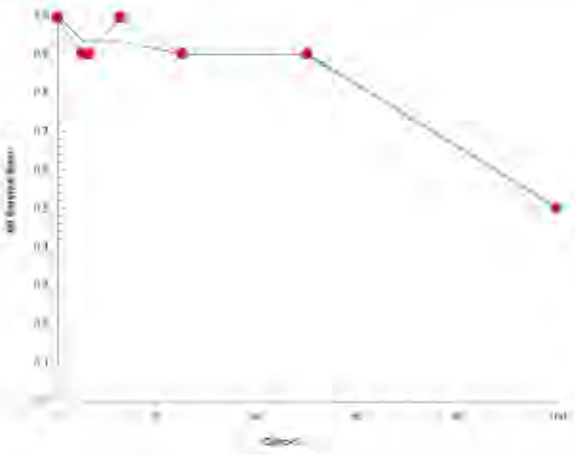
6d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
100		0/1	0/1	1/1	1/1	0/1	1/1	1/1	0/1	0/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	01-8771-0531	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:56	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	A6432040ED3A2D1CD37E6C091BBE3E8	**Editor ID:**	008-848-998-5

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	16-5035-7870	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:57	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	FDDF673BDD486C4FA34ADD87A86BBC2	**Editor ID:**	008-848-998-5
Batch ID:	06-6488-8163	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	11 Jan-21 14:13	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	17 Jan-21 14:59	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	06-1504-5340	**Code:**	24A8D8DC	**Project:**	
Sample Date:	11 Jan-21 07:00	**Material:**	Industrial Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	11 Jan-21 11:10	**CAS (PC):**		**Station:**	
Sample Age:	7h	**Client:**	Barnhardt		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	804092	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	28	15	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	13.55	6.217	15.89	7.381	6.293	16.08
IC50	19.67	17.1	21.91	5.084	4.564	5.847

Reproduction Summary

			Calculated Variate						Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Median**	**Min**	**Max**	**CV%**	**%Effect**	**Mean**	**%Effect**
0	D	10	28	29	15	41	24.22%	0.00%	28	0.00%
5		10	27.2	29	14	34	23.56%	2.86%	27.2	2.86%
6.25		10	26.1	28	6	30	27.24%	6.79%	26.1	6.79%
12.5		10	22.2	22.5	16	31	21.74%	20.71%	22.2	20.71%
25		10	7.9	6.5	2	19	62.71%	71.79%	7.9	71.79%
50		10	1.9	1.5	0	5	87.54%	93.21%	1.9	93.21%
100		10	0	0	0	0	---	100.00%	0	100.00%

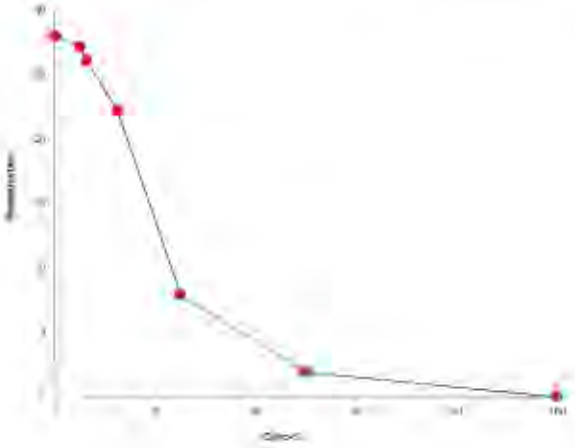
Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	23	41	24	31	30	28	31	31	26	15
5		14	30	33	30	18	27	34	31	27	28
6.25		28	28	28	28	28	30	27	29	6	29
12.5		31	17	24	27	22	25	23	20	17	16
25		5	13	2	10	7	6	19	4	7	6
50		4	0	3	1	0	5	1	2	2	1
100		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	16-5035-7870	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:57	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	FDDF673BDD486C4FA34ADD87A86BBC2	**Editor ID:**	008-848-998-5

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	12-5436-7078	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:55	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	CAD902082E561DA7BBAA05FD4C303AD	**Editor ID:**	008-848-998-5

Batch ID:	06-6488-8163	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**			
Start Date:	11 Jan-21 14:13	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water		
Ending Date:	17 Jan-21 14:59	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable		
Test Length:	6d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture	**Age:**	<24

Sample ID:	06-1504-5340	**Code:**	24A8D8DC	**Project:**			
Sample Date:	11 Jan-21 07:00	**Material:**	Industrial Effluent	**Source:**	Barnhardt (BBA Fiberweb)		
Receipt Date:	11 Jan-21 11:10	**CAS (PC):**		**Station:**			
Sample Age:	7h	**Client:**	Barnhardt				

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	---	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		5	1.0000	Exact	1.0000	Non-Significant Effect
		6.25	1.0000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	1.0000	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	1.0000	Exact	1.0000	Non-Significant Effect

2d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1.0000	0.0000	0.00%
5		10	0	10	1.0000	0.0000	0.00%
6.25		10	0	10	1.0000	0.0000	0.00%
12.5		10	0	10	1.0000	0.0000	0.00%
25		10	0	10	1.0000	0.0000	0.00%
50		10	0	10	1.0000	0.0000	0.00%
100		10	0	10	1.0000	0.0000	0.00%

2d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

2d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

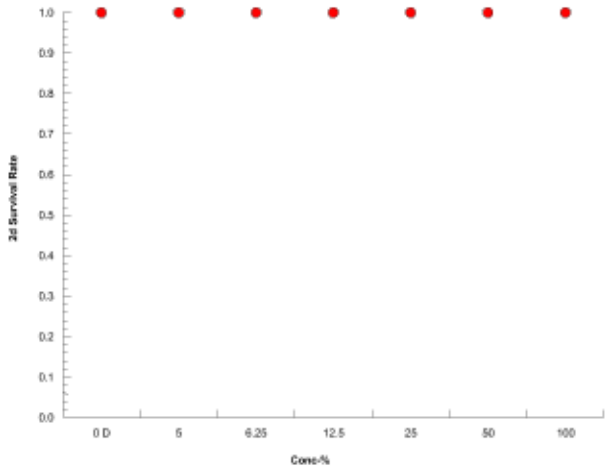
Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	12-5436-7078	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:55	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	CAD902082E561DA7BBAA05FD4C303AD	**Editor ID:**	008-848-998-5

2d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	15-0578-6569	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:56	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	A6432040ED3A2D1CD37E6C091BBE3E8	**Editor ID:**	008-848-998-5
Batch ID:	06-6488-8163	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	11 Jan-21 14:13	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	17 Jan-21 14:59	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	06-1504-5340	**Code:**	24A8D8DC	**Project:**	
Sample Date:	11 Jan-21 07:00	**Material:**	Industrial Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	11 Jan-21 11:10	**CAS (PC):**		**Station:**	
Sample Age:	7h	**Client:**	Barnhardt		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	---	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		5	0.5000	Exact	1.0000	Non-Significant Effect
		6.25	0.5000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	0.5000	Exact	1.0000	Non-Significant Effect
		50	0.5000	Exact	1.0000	Non-Significant Effect
		100	0.0163	Exact	0.0975	Non-Significant Effect

6d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1.0000	0.0000	0.00%
5		9	1	10	0.9000	0.1000	10.00%
6.25		9	1	10	0.9000	0.1000	10.00%
12.5		10	0	10	1.0000	0.0000	0.00%
25		9	1	10	0.9000	0.1000	10.00%
50		9	1	10	0.9000	0.1000	10.00%
100		5	5	10	0.5000	0.5000	50.00%

6d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
5		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
6.25		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
50		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
100		10	0.5000	0.1230	0.8770	0.5000	0.0000	1.0000	0.1667	105.41%	50.00%

6d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
100		0.0000	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000	0.0000	1.0000

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	15-0578-6569	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	20 Jan-21 16:56	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	20 Jan-21 16:53	**MD5 Hash:**	A6432040ED3A2D1CD37E6C091BBE3E8	**Editor ID:**	008-848-998-5

6d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
100		0/1	0/1	1/1	1/1	0/1	1/1	1/1	0/1	0/1	1/1

Graphics

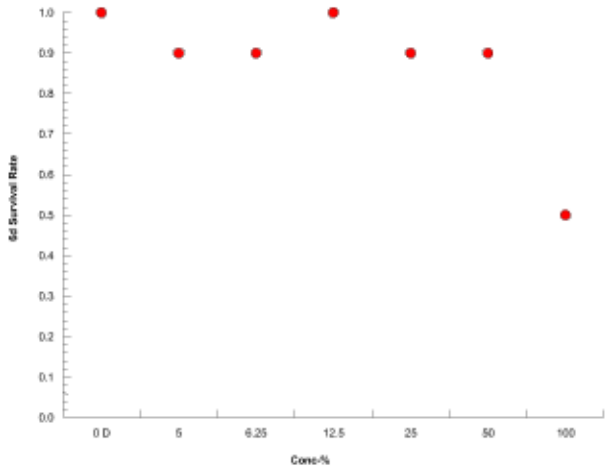


Table of Random Permutations of 16

C.dubia Test ID# 21-49

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3	1	4	5	14	13	3	14	9	13	13	2	9	15	6	2	8	4	5	8
11	8	16	14	15	6	2	6	2	16	8	5	12	3	9	13	4	3	10	4
14	9	1	6	3	9	14	13	8	6	5	8	14	7	3	15	13	11	4	7
2	16	10	13	5	5	13	2	11	7	3	12	5	14	12	16	2	2	9	15
4	6	13	7	2	15	1	9	1	4	7	10	6	9	11	9	7	6	16	11
6	14	6	10	4	14	4	15	3	3	4	16	2	6	5	1	12	10	6	9
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12	10	7	12	9	11	9	8	12	14	15	4	11	8	16	8	9	14	14	1
15	7	5	2	10	7	8	12	6	15	6	13	16	12	15	4	11	8	12	6
16	2	11	8	8	8	15	5	16	1	1	9	8	1	8	14	16	5	13	5
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8	11	9	4	11	3	12	7	7	10	12	14	3	10	1	6	15	16	15	12
1	5	12	11	16	16	5	4	14	9	16	11	1	2	10	5	1	15	7	13
5	4	3	9	12	1	6	1	15	11	2	6	4	11	2	11	3	7	11	16
										REP	CONC								
11	8	16	5	5	13	1	13	2	16	14	12	9	8	7	5	13	3	13	3
2	2	8	8	14	16	4	3	8	11	10	14	15	1	2	11	4	5	15	9
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12	7	15	15	15	9	8	12	12	13	15	10	1	4	6	16	2	6	11	1
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7	9	7	7	11	1	7	16	13	1	13	2	4	2	1	2	12	2	10	14
13	16	9	1	1	8	10	9	9	4	1	16	2	3	8	14	1	10	6	10
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8	13	13	3	3	10	13	2	4	1	8	6	11	14	15	6	9	16	2	2
16	16	5	12	11	6	1	3	8	16	3	7	2	5	16	14	13	7	14	15

Ceriodaphnia dubia Culture Chart

Lot # CA20 (RMH 330) B

Brood mother source: RMH B24 Q. 2 Source's brood size: 22 (Qty.)

Bernhardt 1-11-21

Tech	AH	CMH	AH	AH	SJB		AH	AH
Date	12-28	12-29	12-30	12-31	1-1		1-3	1-4
Day acc.	0	1	2	3	4	5	6	7
Cup # 1	N	N	N	4	N		2Y	N
2	N	N	N	6	N		2Y	N
3	N	N	N	7	N		2Y	N
4	N	N	N	5	N		2Y	N
5	N	N	N	7	N		2Y	N
6	N	N	N	6	N		2Y	N
7	N	N	N	4	N		2Y	N
8	N	N	N	6	N		2Y	N
9	N	N	N	7	N		2Y	N
10	N	N	N	6	N		2Y	N
11	N	N	N	5	N		2Y	N
12	N	N	N	6	N		2Y	N
13	N	N	N	5	N		2Y	N

Tech	AH	AH	AH	KF		SJB	AH
Date	1-5	1-6	1-7	1-8		1-10	1-11
Day acc.	8	9	10	11	12	13	14
1	Y	Y	N	T1 Y18		Y	Y
2	T1 Y20	Y	N	T2 Y23		Y	T1 Y19
3	T2 Y19	Y	N	T3 Y21		Y	T2 Y16
4	T3 Y19	Y	N	T4 Y18		Y	T3 Y15
5	Y	Y	N	T5 Y21		Y	T4 Y17
6	T4 Y19	Y	N	T6 Y18		Y	T5 Y20
7	Y	Y	N			Y	Y
8	Y	Y	N	T7 Y24		Y	Y
9	T5 Y20	Y	N	T8 Y19		Y	Y
10	T6 Y21	Y	N	Y		Y	Y
11	T7 Y18	Y	N	T9 Y23		Y	T6 Y19
12	T8 Y19	Y	N	T10 Y21		Y	T7 Y18
13	T9 Y21	X					

Y = neonates present, and *criterion has been met:* ≥ 20 neonates produced in total by 3rd brood. **N** = no neonates

2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood. **X** = brood mother dead **ae** = aborted eggs

✓ or **P** = neonates present after renewal on previous day (see time in log). **A→** = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted). **acc.** = *if acclimated*. H_2O type used w/ renewal this day.

Test organism collection:

Project #	Symbols (✓ / P)	Tray diagram used? (Y/N)	Time period, neonates released	Collection date / time
899146	T	Y	1-4-21/1550 → 1-4-21/1815	1-5-21/1150
44240 2 hrs	T	Y	1-7-21/1350 → 1-7-21/1630	1-8-21/1000
44654	T	Y	1-10-21/1530 → 1-10-21/1845	1-11-21/1145
	T			
	T			
	T			

Ceriodaphnia dubia Culture Chart

Lot # CD20 (RMH 330) A

Brood mother source: RMH 329 A-11 Source's brood size: 19 (Qty.)

Barnhardt 1-11-21

Tech	AH	CMH	AH	AH	SJP		AH	AH		AH	AH	AH	KF		SJP	AH
Date	12-28	12-29	12-30	12-31	1-1		1-3	1-4		1-5	1-6	1-7	1-8		1-10	1-11
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup # 1	N	N	N	N	6		13	Y	1	T10 Y 19	N	Y	Y		Y	T1 Y 17
2	N	N	N	N	6		24	Y	2	T1 Y 21	N	Y	T1 Y 18		Y	Y
3	N	N	N	N	5		24	N	3	T2 Y 22	N	Y	T2 Y 19		Y	T2 Y 20
4	N	N	N	N	6		12	Y	4	T3 Y 18	N	Y	T3 Y 21		Y	T3 Y 16
5	N	N	N	N	7		13	Y	5	T4 Y 19	N	Y	T4 Y 20		Y	T4 Y 19
6	N	N	N	6	N		24	N	6	T5 Y 18	N	Y	T5 Y 19		Y	T5 Y 18
7	N	N	N	N	5		24	N	7	T6 Y 18	Y	N	T6 Y 19		Y	T6 Y 21
8	N	N	N	5	N		24	N	8	T7 Y 20	Y	N	T7 Y 18		Y	T7 Y 19
9	N	N	N	N	6		2Y	N	9	T8 Y 17	Y	N	T8 Y 19		Y	T9 Y 19
10	N	N	N	N	7		24	N	10	T9 Y 21	Y	N	T9 Y 18		Y	T10 Y 19
11	N	N	N	N	5		10	Y	11	T10 Y 18	N	Y	T10 Y 17		Y	T8 Y 20
12	N	N	N	N	5		13	Y	12	Y	N	Y	Y		Y	T5 Y 18
13	N	N	N	5	N		2Y	N	13	Y	Y	N	Y		Y	T10 Y 20

Y = neonates present, and *criterion has been met:* ≥ 20 neonates produced in total by 3rd brood. **N** = no neonates

2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood. **X** = brood mother dead **ae** = aborted eggs

✓ or **P** = neonates present after renewal on previous day (see time in log). **A→** = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted). **acc.** = *if acclimated*; H_2O type used w/ renewal **this** day.

Test organism collection:

Project #	Symbols (✓ / P)	Tray diagram used? (Y/N)	Time period, neonates released	Collection: date / time
8991416	T	Y	1-4-21/1550 → 1-4-21/1815	1-5-21/1150
561656	(T)	Y	1-4-21/1550 → 1-4-21/1815	1-5-21/1230
14240 Lab	T	Y	*1-7-21/1630 → 1-7-21/1745	1-8-21/0940
444654	T	Y	1-10-21/1530 → 1-10-21/1845	1-11-21/1145
466616	(T)	Y	1-10-21/1730 → 1-10-21/1845	1-11-21/1200
	T			

CHEMICAL ANALYSIS

Please note the subcontract laboratory has its own QAQC and data review processes, and therefore New England Bioassay does not review the analytical results we receive.

PHOENIX
Environmental Laboratories, Inc.

Friday, January 15, 2021

Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT MFG
SDG ID: GCH43876
Sample ID#s: CH43876 - CH43878

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

January 15, 2021

SDG I.D.: GCH43876

Project ID: BARNHARDT MFG

Client Id	Lab Id	Matrix
C41-1086 EFF #1	CH43876	WASTE WATER
C41-1087 NORTH RIVER #1	CH43877	WATER
EFF GRAB #1	CH43878	WASTE WATER

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 15, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		01/11/21	7:00
Location Code:	NEB	Received by:	SW	01/11/21	15:06
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH43876
Phoenix ID: CH43876

Project ID: BARNHARDT MFG
Client ID: C41-1086 EFF #1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.038	0.010	mg/L	1	01/14/21	EK	E200.7
Cadmium	0.0004	0.0001	mg/L	1	01/12/21	RS	SM3113B
Copper	0.0277	0.0010	mg/L	1	01/14/21	EK	E200.7
Hardness (CaCO3)	79.8	0.1	mg/L	1	01/14/21		SM2340B
Nickel	0.004	0.001	mg/L	1	01/14/21	EK	E200.7
Lead	0.0006	0.0003	mg/L	1	01/12/21	RS	SM3113B
Zinc	0.047	0.002	mg/L	1	01/14/21	EK	E200.7
Alkalinity-CaCO3	888	50.0	mg/L	10	01/11/21	AP/EG	SM2320B-11
Conductivity	2000	50.0	umhos/cm	10	01/11/21	AP/EG	SM2510B-11
Ammonia as Nitrogen	< 1.00	1.00	mg/L	20	01/15/21	KDB	E350.1
Tot. Diss. Solids	1200	33	mg/L	3.3	01/12/21	LS	SM2540C-11
Tot. Org. Carbon	15.5	0.50	mg/L	1	01/12/21	ARG	SM5310B-11
Total Solids	1400	50	mg/L	5	01/12/21	LS	SM2540B-11
Total Metals Digestion	Completed				01/13/21	AG	

Project ID: BARNHARDT MFG
Client ID: C41-1086 EFF #1

Phoenix I.D.: CH43876

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

TOC Analysis:
This sample was received with a pH>2. The EPA requires preservation at time of sampling to a pH of <2. A sample bias can not be ruled out.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
January 15, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 15, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		01/11/21	6:30
Location Code:	NEB	Received by:	SW	01/11/21	15:06
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH43876
Phoenix ID: CH43877

Project ID: BARNHARDT MFG
Client ID: C41-1087 NORTH RIVER #1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.126	0.010	mg/L	1	01/14/21	EK	SW6010D/E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	01/12/21	RS	SM3113B/SW7010-10
Copper	0.0021	0.0010	mg/L	1	01/14/21	EK	SW6010D/E200.7
Hardness (CaCO3)	28.6	0.1	mg/L	1	01/14/21		E200.7
Nickel	< 0.001	0.001	mg/L	1	01/14/21	EK	SW6010D/E200.7
Lead	< 0.0003	0.0003	mg/L	1	01/12/21	RS	SM3113B/SW7010
Zinc	0.005	0.002	mg/L	1	01/14/21	EK	SW6010D/E200.7
Alkalinity-CaCO3	27.1	5.00	mg/L	1	01/11/21	AP/EG	SM2320B-11
Conductivity	86	5.00	umhos/cm	1	01/11/21	AP/EG	SM2510B-11
Ammonia as Nitrogen	0.08	0.05	mg/L	1	01/15/21	KDB	E350.1
pH	7.40	1.00	pH Units	1	01/11/21 22:19	AP/EG	SM4500-H B-11
Tot. Org. Carbon	1.81	0.50	mg/L	1	01/12/21	ARG	SM5310B-11
Total Metals Digestion	Completed				01/13/21	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
January 15, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 15, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		01/11/21	7:00
Location Code:	NEB	Received by:	SW	01/11/21	15:06
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH43876
Phoenix ID: CH43878

Project ID: BARNHARDT MFG
Client ID: EFF GRAB #1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	01/11/21 16:41	MW	SM4500CLG-97
pH	8.51	1.00	pH Units	1	01/11/21 22:24	AP/EG	SM4500-H B-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
January 15, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

January 15, 2021

QA/QC Data

SDG I.D.: GCH43876

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 559342 (mg/L), QC Sample No: CH43107 (CH43876, CH43877)													
Cadmium - Water	BRL	0.0001	0.0003	0.0002	NC	110			118			75 - 125	20
QA/QC Batch 559342 (mg/L), QC Sample No: CH43107 (CH43876, CH43877)													
Lead (Furnace) - Water	BRL	0.001	0.0341	0.032	6.40	98.6			104			75 - 125	30
QA/QC Batch 559641 (mg/L), QC Sample No: CH44944 (CH43876, CH43877)													
ICP Metals - Aqueous													
Aluminum	BRL	0.010	0.039	0.034	NC	99.0	97.0	2.0	101			80 - 120	20
Copper	BRL	0.0025	<0.003	0.0035	NC	98.1	96.0	2.2	99.0			80 - 120	20
Nickel	BRL	0.0005	<0.001	0.0005	NC	98.8	96.3	2.6	97.0			80 - 120	20
Zinc	BRL	0.0020	0.002	0.0027	NC	97.7	95.4	2.4	96.8			80 - 120	20

Comment:

Additional: LCS acceptance range is 80-120% MS acceptance range 75-125%.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

January 15, 2021

QA/QC Data

SDG I.D.: GCH43876

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 559420 (mg/L), QC Sample No: CH43873 (CH43876, CH43877)													
Alkalinity-CaCO3	BRL	5.00	64.4	66.7	3.50	103						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559417 (pH), QC Sample No: CH43873 (CH43877, CH43878)													
pH			7.53	7.55	0.30	98.8						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559410 (mg/L), QC Sample No: CH43879 (CH43876)													
Tot. Diss. Solids	BRL	10	210	220	4.70	90.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559423 (umhos/cm), QC Sample No: CH43883 (CH43876, CH43877)													
Conductivity	BRL	5.00	216	213	1.40	94.6						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559437 (mg/L), QC Sample No: CH43885 (CH43876)													
Total Solids	BRL	10	230	250	8.30	100						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559551 (mg/L), QC Sample No: CH43938 (CH43876, CH43877)													
Total Organic Carbon	BRL	1.0	3.1	3.2	NC	103			112			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559762 (mg/L), QC Sample No: CH42758 (CH43876, CH43877)													
Ammonia as Nitrogen	BRL	0.05	3.88	3.90	0.50	99.3			97.8			90 - 110	20
QA/QC Batch 559334 (mg/L), QC Sample No: CH43805 (CH43878)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	104							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
January 15, 2021

Friday, January 15, 2021

Criteria: None

State: MA

Sample Criteria Exceedances Report

GCH43876 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

January 15, 2021 SDG I.D.: GCH43876

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

Chronic Sample Set #1

Coolant: IPK [X] ICE [ ] Cooler: Yes [X] No [ ] No [ ]

CHAIN OF CUSTODY RECORD

PHOENIX
Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 1.2 °C Pg ___ of ___

Data Delivery/Contact Options:
[ ] Fax: ______
[ ] Phone:
[X] Email: Kimberly.wills@nebiz.com

Customer: NEB
Address: 77 Batson Drive
Manchester, CT 06042

Project: Barnhardt Mfg
Report to: Kim Wills
Invoice to: Kim Wills
QUOTE #

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ______________ Date: ______

Matrix Code:
DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water
RW=Raw Water SE=Sediment SL=Sludge S=Soil SD=Solid W=Wipe OIL=Oil
B=Bulk L=Liquid X = ________(Other)

Analysis Request

	PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hardness, alkalinity	Specific conductance	Total solids	Total dissolved solids	Ammonia	Total residual chlorine	pH	TOC	Cd(AB) Pb(AB) Cu, Ni, Zn, Al	MS/MSD*	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) 1oz	GL Soil container ( ) 1oz	40 ml VOA Vial [ ] As Is [ ] HCL	GL Amber 1000ml [ ] As Is [ ] H2SO4	PL As Is [✓] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [✓] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
C41-1086	43876	Eff #1	WW	1/10/21 - 1/11/21	0700 - 0700	X	X	X	X	X			X	X		1						1	1	1			
C41-1087	43877	North River #1	O	1/11/21	0630	X				X		X	X	X		1						1	1	1			
	43878	Eff grab #1	WW	1/11/21	0700						X	X										1					

Relinquished by:	Accepted by:	Date:	Time:
Krystal Frederic	[signature]	1-11-21	1440
[signature]	[signature]	1-11-21	1506

Comments, Special Requirements or Regulations:
Cd - 0.0005 mg/L Cu - 0.003 mg/L
Pb - 0.0005 mg/L Ni - 0.005 mg/L
Zn - 0.005 mg/L Al - 0.02 mg/L

*MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.

Turnaround Time:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[X] Standard
[ ] Other
* SURCHARGE APPLIES

RI
[ ] (Residential) Direct Exposure
[ ] (Comm/Industrial) Direct Exposure
[ ] GA Leachability
[ ] GB Leachability
[ ] GA GW Objectives
[ ] GB-GW Objectives

CT
[ ] RCP Cert
[ ] GW Protection
[ ] SW Protection
[ ] GA Mobility
[ ] GB Mobility
[ ] Residential DEC
[ ] I/C DEC
[ ] Other

MA
[ ] MCP Certification
[ ] GW-1 [ ] MWRA eSMART
[ ] GW-2 [ ] S-1 10% CALC
[ ] GW-3
[ ] S-1 GW-1 [ ] S-1 GW-2 [ ] S-1 GW-3
[ ] S-2 GW-1 [ ] S-2 GW-2 [ ] S-2 GW-3
[ ] S-3 GW-1 [ ] S-3 GW-2 [ ] S-3 GW-3
[ ] SW Protection

State where samples were collected: MA

Data Format
[ ] Excel
[ ] PDF
[ ] GIS/Key
[ ] EQuIS
[ ] Other
Data Package
[ ] Tier II Checklist
[ ] Full Data Package*
[ ] Phoenix Std Report
[ ] Other
* SURCHARGE APPLIES

PEL-126 REV. 06/20

PHOENIX
Environmental Laboratories, Inc.

Tuesday, January 19, 2021

Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT MFG.
SDG ID: GCH45615
Sample ID#s: CH45615 - CH45617

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

January 19, 2021

SDG I.D.: GCH45615

Project ID: BARNHARDT MFG.

Client Id	Lab Id	Matrix
C41-1130 EFF #2	CH45615	WASTE WATER
C41-1131 NORTH RIVER #2	CH45616	WATER
EFF GRAB #2	CH45617	WASTE WATER

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 19, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		01/13/21	7:00
Location Code:	NEB	Received by:	LB	01/13/21	16:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH45615
Phoenix ID: CH45615

Project ID: BARNHARDT MFG.
Client ID: C41-1130 EFF #2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.064	0.010	mg/L	1	01/16/21	CPP	E200.7
Cadmium	0.0004	0.0001	mg/L	1	01/18/21	RS	SM3113B
Copper	0.0267	0.0010	mg/L	1	01/16/21	CPP	E200.7
Hardness (CaCO3)	80.3	0.1	mg/L	1	01/17/21		SM2340B
Nickel	0.004	0.001	mg/L	1	01/16/21	CPP	E200.7
Lead	0.0004	0.0003	mg/L	1	01/15/21	RS	SM3113B
Zinc	0.049	0.002	mg/L	1	01/16/21	CPP	E200.7
Alkalinity-CaCO3	843	50.0	mg/L	10	01/14/21	AP/EG	SM2320B-11
Conductivity	1960	50.0	umhos/cm	10	01/14/21	AP/EG	SM2510B-11
Ammonia as Nitrogen	0.40	0.25	mg/L	5	01/16/21	KDB	E350.1
Tot. Diss. Solids	1100	100	mg/L	10	01/15/21	BJA/QH	SM2540C-11
Tot. Org. Carbon	78.5	5.0	mg/L	10	01/15/21	ARG	SM5310B-11
Total Solids	1300	20	mg/L	2	01/14/21	LS/ARG	SM2540B-11
Total Metals Digestion	Completed				01/15/21	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
January 19, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 19, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		01/13/21	6:30
Location Code:	NEB	Received by:	LB	01/13/21	16:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH45615
Phoenix ID: CH45616

Project ID: BARNHARDT MFG.
Client ID: C41-1131 NORTH RIVER #2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.040	0.010	mg/L	1	01/16/21	CPP	SW6010D/E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	01/18/21	RS	SM3113B/SW7010-10
Copper	0.0011	0.0010	mg/L	1	01/16/21	CPP	SW6010D/E200.7
Hardness (CaCO3)	27.6	0.1	mg/L	1	01/17/21		E200.7
Nickel	< 0.001	0.001	mg/L	1	01/16/21	CPP	SW6010D/E200.7
Lead	< 0.0003	0.0003	mg/L	1	01/15/21	RS	SM3113B/SW7010
Zinc	0.003	0.002	mg/L	1	01/16/21	CPP	SW6010D/E200.7
Alkalinity-CaCO3	25.4	6.00	mg/L	1	01/14/21	AP/EG	SM2320B-11
Chlorine Residual	< 0.02	0.02	mg/L	1	01/13/21 19:30	MW	SM4500CLG-97
Conductivity	80	5.00	umhos/cm	1	01/14/21	AP/EG	SM2510B-11
pH	7.40	1.00	pH Units	1	01/14/21 00:30	AP	SM4500-H B-11
Tot. Org. Carbon	1.28	0.50	mg/L	1	01/15/21	ARG	SM5310B-11
Total Metals Digestion	Completed				01/15/21	AG	

Project ID: BARNHARDT MFG.
Client ID: C41-1131 NORTH RIVER #2

Phoenix I.D.: CH45616

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

January 19, 2021

Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 19, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		01/13/21	7:00
Location Code:	NEB	Received by:	LB	01/13/21	16:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH45615
Phoenix ID: CH45617

Project ID: BARNHARDT MFG.
Client ID: EFF GRAB #2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	01/13/21 19:29	MW	SM4500CLG-97
pH	8.54	1.00	pH Units	1	01/14/21 00:32	AP/EG	SM4500-H B-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
January 19, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

January 19, 2021

QA/QC Data

SDG I.D.: GCH45615

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 559822 (mg/L), QC Sample No: CH45612 (CH45615, CH45616)													
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	108			113			75 - 125	20
QA/QC Batch 559822 (mg/L), QC Sample No: CH45612 (CH45615, CH45616)													
Lead (Furnace) - Water	BRL	0.001	<0.0003	<0.001	NC	105			106			75 - 125	30
QA/QC Batch 560208 (mg/L), QC Sample No: CH46416 (CH45615, CH45616)													
ICP Metals - Aqueous													
Aluminum	BRL	0.010	0.149	0.146	2.00	101	102	1.0	94.5			80 - 120	20
Copper	BRL	0.0025	0.010	0.0102	NC	102	104	1.9	98.5			80 - 120	20
Nickel	BRL	0.0005	0.001	0.0010	NC	101	103	2.0	95.5			80 - 120	20
Zinc	BRL	0.0020	<0.002	<0.0020	NC	102	104	1.9	96.9			80 - 120	20

Comment:

Additional: LCS acceptance range is 80-120% MS acceptance range 75-125%.

PHOENIX

Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

January 19, 2021

QA/QC Data

SDG I.D.: GCH45615

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 559733 (mg/L), QC Sample No: CH45467 (CH45615, CH45616)													
Alkalinity-CaCO3	BRL	6.00	29	28	NC	105						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559737 (umhos/cm), QC Sample No: CH45467 (CH45615, CH45616)													
Conductivity	BRL	5.00	157	156	0.60	94.8						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559729 (pH), QC Sample No: CH45467 (CH45616, CH45617)													
pH			7.53	7.48	0.70	98.8						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559765 (mg/L), QC Sample No: CH45612 (CH45615)													
Total Solids	BRL	10	600	610	1.70	100						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 559939 (mg/L), QC Sample No: CH45618 (CH45615)													
Tot. Diss. Solids	BRL	10	49	55	NC	96.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 560369 (mg/L), QC Sample No: CH45709 (CH45615, CH45616)													
Total Organic Carbon	BRL	1.0	<1.0	<1.0	NC	101			102			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 560307 (mg/L), QC Sample No: CH44639 (CH45615)													
Ammonia as Nitrogen	BRL	0.05	7.22	7.04	2.50	97.2			103			90 - 110	20
QA/QC Batch 559668 (mg/L), QC Sample No: CH45616 (CH45616, CH45617)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	93.3							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
January 19, 2021

Tuesday, January 19, 2021

Criteria: None

State: MA

Sample Criteria Exceedances Report

GCH45615 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

January 19, 2021 SDG I.D.: GCH45615

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

Chronic Sample #2

Cooler: Yes ☒ No ☐
Coolant: IPK ☒ ICE ☐ No ☐

CHAIN OF CUSTODY RECORD

PHOENIX
Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 20 °C Pg of

Data Delivery/Contact Options:
☐ Fax:
☐ Phone:
☒ Email: Kimberly.wills@nebio.com

Customer: NEB
Address: 77 Batson Drive, Manchester, CT 06042

Project: Barnhardt Mfg
Report to: Kim Wills
Invoice to: Kim Wills
QUOTE #

Project P.O: 22881

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ____________ Date: ________

Matrix Code:
DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water
RW=Raw Water SE=Sediment SL=Sludge S=Soil SD=Solid W=Wipe OIL=Oil
B=Bulk L=Liquid X = __________ (Other)

Analysis Request

	PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hardness	alkalinity	Specific conductance	Total solids	Total dissolved solids	Ammonia	Total organic carbon	Cd(AA), Pb(AA), Cu, Ni, Zn, Al	Total residual chlorine	pH	MS/MSD*	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As Is [ ] HCL	GL Amber 1000ml [ ] As Is [ ] H2SO4	PL As Is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
C41-1130	456615	Eff #2	WW	1/12-13/21	0720-0700	X	X	X	X	X	X	X					1						1	1	1			
C41-1131	456616	North River #2	0	1/13/21	0630	X	X			X	X	X			X		1						1	1	1			
	456617	Eff grab #2	WW	1/13/21	0700									X	X								1					

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	1-13-21	1605
[signature]	[signature]	1-13-21	1630

Comments, Special Requirements or Regulations:
Cd 0.0005 mg/L Cu - 0.003 mg/L
Pb 0.0005 mg/L Ni - 0.005 mg/L
Zn - 0.005 mg/L Al - 0.02 mg/L

*MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.

Turnaround Time:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Residential Direct Exposure
☐ Comm/Industrial Direct Exposure
☐ GA Leachability
☐ GB Leachability
☐ GA-GW Objectives
☐ GB GW Objectives

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1 ☐ MWRA eSMART
☐ GW-2 ☐ S-1 10% CALC
☐ GW-3
☐ S-1 GW-1 ☐ S-1 GW-2 ☐ S-1 GW-3
☐ S-2 GW-1 ☐ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ SW Protection

State where samples were collected: MA

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other

* SURCHARGE APPLIES

PCL-126 REV. 06/20

PHOENIX
Environmental Laboratories, Inc.

Thursday, January 21, 2021

Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT
SDG ID: GCH47416
Sample ID#s: CH47416 - CH47418

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

January 21, 2021

SDG I.D.: GCH47416

Project ID: BARNHARDT

Client Id	Lab Id	Matrix
EFF #3 C41-1169	CH47416	WASTE WATER
NORTH RIVER #3 C41-1170	CH47417	WATER
EFF GRAB #3	CH47418	WASTE WATER

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 21, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		01/15/21	7:00
Location Code:	NEB	Received by:	SW	01/15/21	15:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH47416
Phoenix ID: CH47416

Project ID: BARNHARDT
Client ID: EFF #3 C41-1169

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.026	0.010	mg/L	1	01/19/21	EK	E200.7
Cadmium	0.0004	0.0001	mg/L	1	01/20/21	RS	SM3113B
Copper	0.0252	0.0010	mg/L	1	01/19/21	EK	E200.7
Hardness (CaCO3)	77.9	0.1	mg/L	1	01/19/21		SM2340B
Nickel	0.004	0.001	mg/L	1	01/19/21	EK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	01/19/21	RS	SM3113B
Zinc	0.043	0.002	mg/L	1	01/19/21	EK	E200.7
Alkalinity-CaCO3	940	25.0	mg/L	5	01/15/21	AP/EG	SM2320B-11
Conductivity	2060	25.0	umhos/cm	5	01/15/21	AP/EG	SM2510B-11
Ammonia as Nitrogen	< 0.25	0.25	mg/L	5	01/21/21	KDB	E350.1
Tot. Diss. Solids	1200	20	mg/L	2	01/18/21	LS	SM2540C-11
Tot. Org. Carbon	74.8	2.5	mg/L	5	01/18/21	ARG/BJA	SM5310B-11
Total Solids	1500	20	mg/L	2	01/19/21	LS	SM2540B-11
Total Metals Digestion	Completed				01/18/21	AG	

Project ID: BARNHARDT
Client ID: EFF #3 C41-1169

Phoenix I.D.: CH47416

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

TOC Analysis:
This sample was received with a pH>2. The EPA requires preservation at time of sampling to a pH of <2. A sample bias can not be ruled out.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
January 21, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 21, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		01/15/21	6:30
Location Code:	NEB	Received by:	SW	01/15/21	15:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH47416
Phoenix ID: CH47417

Project ID: BARNHARDT
Client ID: NORTH RIVER #3 C41-1170

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.031	0.010	mg/L	1	01/19/21	EK	SW6010D/E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	01/20/21	RS	SM3113B/SW7010-10
Copper	0.0012	0.0010	mg/L	1	01/19/21	EK	SW6010D/E200.7
Hardness (CaCO3)	27.5	0.1	mg/L	1	01/19/21		E200.7
Nickel	< 0.001	0.001	mg/L	1	01/19/21	EK	SW6010D/E200.7
Lead	< 0.0003	0.0003	mg/L	1	01/19/21	RS	SM3113B/SW7010
Zinc	0.003	0.002	mg/L	1	01/19/21	EK	SW6010D/E200.7
Alkalinity-CaCO3	25.8	5.00	mg/L	1	01/15/21	AP/EG	SM2320B-11
Conductivity	84	5.00	umhos/cm	1	01/15/21	AP/EG	SM2510B-11
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	01/21/21	KDB	E350.1
pH	7.19	1.00	pH Units	1	01/15/21 22:27	AP/EG	SM4500-H B-11
Tot. Org. Carbon	1.41	0.50	mg/L	1	01/18/21	ARG/BJA	SM5310B-11
Total Metals Digestion	Completed				01/18/21	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
January 21, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

January 21, 2021

FOR: Attn: Ms. Kim Wills
New England Bioassay
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		01/15/21	7:00
Location Code:	NEB	Received by:	SW	01/15/21	15:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22881				

Laboratory Data

SDG ID: GCH47416
Phoenix ID: CH47418

Project ID: BARNHARDT
Client ID: EFF GRAB #3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	01/15/21 18:22	MW	SM4500CLG-97
pH	8.40	1.00	pH Units	1	01/15/21 22:29	AP/EG	SM4500-H B-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
January 21, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

January 21, 2021

QA/QC Data

SDG I.D.: GCH47416

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 559822 (mg/L), QC Sample No: CH45612 (CH47416, CH47417)													
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	108			113			75 - 125	20
QA/QC Batch 560477 (mg/L), QC Sample No: CH47417 (CH47416, CH47417)													
Lead (Furnace) - Water	BRL	0.001	<0.0003	<0.001	NC	110			117			75 - 125	30
QA/QC Batch 560474 (mg/L), QC Sample No: CH47211 (CH47416, CH47417)													
ICP Metals - Aqueous													
Aluminum	BRL	0.010	0.033	0.036	NC	98.5	98.7	0.2	107			80 - 120	20
Copper	BRL	0.0025	0.007	0.0062	NC	99.2	99.4	0.2	103			80 - 120	20
Nickel	BRL	0.0005	0.014	0.0132	5.90	95.1	96.3	1.3	90.7			80 - 120	20
Zinc	BRL	0.0020	0.034	0.0325	4.50	93.5	94.5	1.1	93.3			80 - 120	20

Comment:

Additional: LCS acceptance range is 80-120% MS acceptance range 75-125%.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

January 21, 2021

QA/QC Data

SDG I.D.: GCH47416

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 560442 (mg/L), QC Sample No: CH46799 (CH47416)													
Tot. Diss. Solids	BRL	10	220	210	4.70	90.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 560542 (mg/L), QC Sample No: CH46971 (CH47416, CH47417)													
Total Organic Carbon	BRL	1.0	3.9	4.0	NC	85.0			101			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 560392 (mg/L), QC Sample No: CH47365 (CH47416, CH47417)													
Alkalinity-CaCO3	BRL	5.00	222	223	0.40	103						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 560395 (umhos/cm), QC Sample No: CH47365 (CH47416, CH47417)													
Conductivity	BRL	5.00	567	562	0.90	97.7						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 560390 (pH), QC Sample No: CH47365 (CH47416, CH47417, CH47418)													
pH			7.65	7.61	0.50	98.8						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 560561 (mg/L), QC Sample No: CH47416 (CH47416)													
Total Solids	BRL	10	1500	1400	6.90	105						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 560805 (mg/L), QC Sample No: CH46676 (CH47416, CH47417)													
Ammonia as Nitrogen	BRL	0.05	<0.10	<0.10	NC	95.5			98.5			90 - 110	20
QA/QC Batch 560318 (mg/L), QC Sample No: CH47563 (CH47418)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	97.0							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
January 21, 2021

Thursday, January 21, 2021

Criteria: None

State: MA

Sample Criteria Exceedances Report

GCH47416 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

January 21, 2021 SDG I.D.: GCH47416

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

Chronic Sample Set #3

Cooler: Yes [X] No [ ]
Coolant: IPK [X] ICE [ ] No [ ]

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 1.3 °C Pg ___ of ___

Data Delivery/Contact Options:
[ ] Fax:
[ ] Phone:
[X] Email: kimberly.wills@nebio.com

Customer: NEB
Address: 77 Batson Drive, Manchester, CT 06042

Project: Barnhardt
Report to: Kim Wills
Invoice to: Kim Wills
QUOTE #

Project P.O: 22881

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ______________ Date:

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = ____________(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hardness alkalinity	Specific conductance	Total solids	Total Dissolved solids	Ammonia	TOC	Cd (Al), Pb (Al), Cu, Ni, Zn, Al	Total residual chlorine	pH
47416	Eff #3 CW1-1169	WW	1/14-1/15/21	0740-0700	X	X	X	X	X	X	X		
47417	North River #3 CW1-1170	0	1/15/21	0630	X	X			X	X	X		X
47418	Eff grab #3	WW	1/15/21	0700								X	X

SAMPLE #	MS/MSD*	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container [ ] oz	GL Soil container [ ] oz	40 ml VOA Vial [ ] As is [ ] HCL	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
47416		1						1	1	1			
47417		1						1	1	1			
47418								1					

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	1-15-21	1500
[signature]	[signature]	1-15-21	1530

Comments, Special Requirements or Regulations:

Turnaround Time:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[X] Standard
[ ] Other
* SURCHARGE APPLIES

RI
[ ] (Residential) Direct Exposure
[ ] (Comm/Industrial) Direct Exposure
[ ] GA Leachability
[ ] GB Leachability
[ ] GA-GW Objectives
[ ] GB GW Objectives

CT
[ ] RCP Cert
[ ] GW Protection
[ ] SW Protection
[ ] GA Mobility
[ ] GB Mobility
[ ] Residential DEC
[ ] I/C DEC
[ ] Other

MA
[ ] MCP Certification
[ ] GW-1 [ ] MWRA eSMART
[ ] GW-2 [ ] S-1 10% CALC
[ ] GW-3
[ ] S-1 GW-1 [ ] S-1 GW-2 [ ] S-1 GW-3
[ ] S-2 GW-1 [ ] S-2 GW-2 [ ] S-2 GW-3
[ ] S-3 GW-1 [ ] S-3 GW-2 [ ] S-3 GW-3
[ ] SW Protection

State where samples were collected: MA

Data Format
[ ] Excel
[ ] PDF
[ ] GIS/Key
[ ] EQuIS
[ ] Other

Data Package
[ ] Tier II Checklist
[ ] Full Data Package*
[ ] Phoenix Std Report
[ ] Other

* SURCHARGE APPLIES

*MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.

PCL-126 REV. 06/20

SAMPLE RECEIPT CHEMISTRY
&
CHAIN OF CUSTODY DOCUMENTS

NEW ENGLAND BIOASSAY - INITIAL CHEMISTRY DATA

PERMITTEE: Barnhardt Manufacturing Co.

NEB JOB # 44654

DATE RECEIVED	1/11/21		1/13/21		1/15/21	
SAMPLE TYPE:	EFF #1	RIVER #1	EFF #2	RIVER #2	EFF #3	RIVER #3
COC #	C41-1086	C41-1087	C41-1130	C41-1131	C41-1169	C41-1170
pH (SU)	8.2	8.5	8.1	7.6	7.9	7.7
Temperature (^{o}C)	2.7	1.2	6.0	2.9	5.9	3.4
Dissolved Oxygen (mg/L)	10.2	11.7	9.0	10.8	10.3	12.7
Conductivity (µmhos)	1,978	94	1,926	86	2,021	87
Salinity (ppt)	1	<1	1	<1	1	<1
TRC - DPD (mg/L)	<0.001	0.006	<0.001	0.005	0.016	<0.001
TRC - Amperometric (mg/L)	N/A	N/A	N/A	N/A	N/A	N/A
Hardness (mg/L as $CaCO_3$)	92	30	82	30	86	30
Alkalinity (mg/l as $CaCO_3$)	890	25	850	25	890	25
Tech Initials	KF	KF	PD	PD	CH	CH

NOTE: NA = NOT APPLICABLE

Data Reviewed By: Kimberly Wills Date Reviewed: 1/25/21

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set #1

EFFLUENT

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X **Composite**
Sample ID:
Start Date: 1-10-21 Time: 7AM
End Date: 1-11-21 Time: 7AM

Sampling Method: X **Grab** (for pH and TRC only X)
Date Collected: 1-11-21
Time Collected: 7AM

Sample Type:
____ Prechlorinated
____ Dechlorinated
____ Unchlorinated
____ Chlorinated

RECEIVING WATER

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 1-11-21
Time Collected: 6:30AM

Due to COVID-19 safety precautions samples were received in NEB refrigerator

Effluent Sampling Location and Procedures: Composite sample from outfall

Receiving Water Sampling Location and Procedures: Grab sample from north river above outfall

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[signature]	Date:	1-11-21	Time:	0930
Received By:	[signature]	Date:	1-11-21	Time:	0930
Relinquished By:	[signature]	Date:	1-11-21	Time:	1110
Received By:	Krysten Godlewski	Date:	1-11-21	Time:	1110

Optional Information

Purchase Order # to reference on invoice:

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 2.1 °C
Effluent COC# C41-1086

Temperature of Receiving Water Upon Receipt at Lab: 1.2 °C
Receiving Water COC# C41-1087

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set #2

EFFLUENT

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Composite
Sample ID:
Start Date: 1-12-21 Time: 7AM
End Date: 1-13-21 Time: 7AM

Sampling Method: X Grab (for pH and TRC only X)
Date Collected: 1-13-21
Time Collected: 7AM

Sample Type:
____ Prechlorinated
____ Dechlorinated
____ Unchlorinated
____ Chlorinated

RECEIVING WATER

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 1-13-21
Time Collected: 6:30AM

Due to COVID-19 safety precautions Samples were received in NEB refrigerator

Effluent Sampling Location and Procedures: Composite sample from outfall

Receiving Water Sampling Location and Procedures: Grab sample from above outfall

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	Date: 1-13-21	Time: 9:50
Received By:	Date: 1-13-21	Time: 9:50
Relinquished By:	Date: 1-13-21	Time: 11:20
Received By:	Date: 1-13-21	Time: 1130

Optional Information

Purchase Order # to reference on invoice:

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 6.0 °C
Effluent COC# C41-1130

Temperature of Receiving Water Upon Receipt at Lab: 2.9 °C
Receiving Water COC# C41-1131

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set #3

EFFLUENT

Sampler: Keith Cammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X **Composite**
Sample ID:
Start Date: 1-14-21 Time: 7Am
End Date: 1-15-21 Time: 7Am

Sampling Method: X **Grab** (for pH and TRC only X)
Date Collected: 1-15-21
Time Collected: 7Am

Sample Type:
____ Prechlorinated
____ Dechlorinated
____ Unchlorinated
____ Chlorinated

RECEIVING WATER

Sampler: Keith Cammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 1-15-21
Time Collected: 6:30

Due to COVID-19 safety precautions Samples were received in NEB refrigerator

Effluent Sampling Location and Procedures: Composite sample from outfall

Receiving Water Sampling Location and Procedures: Grab sample from above outfall

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:		Date: 1-15-21	Time: 10:00
Received By:		Date: 1-15-21	Time: 10:00
Relinquished By:		Date: 1-15-21	Time: 11:58
Received By:		Date: 1/15/21	Time: 1158

Optional Information

Purchase Order # to reference on invoice:

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 5.9 °C
Temperature of Receiving Water Upon Receipt at Lab: 3.4 °C

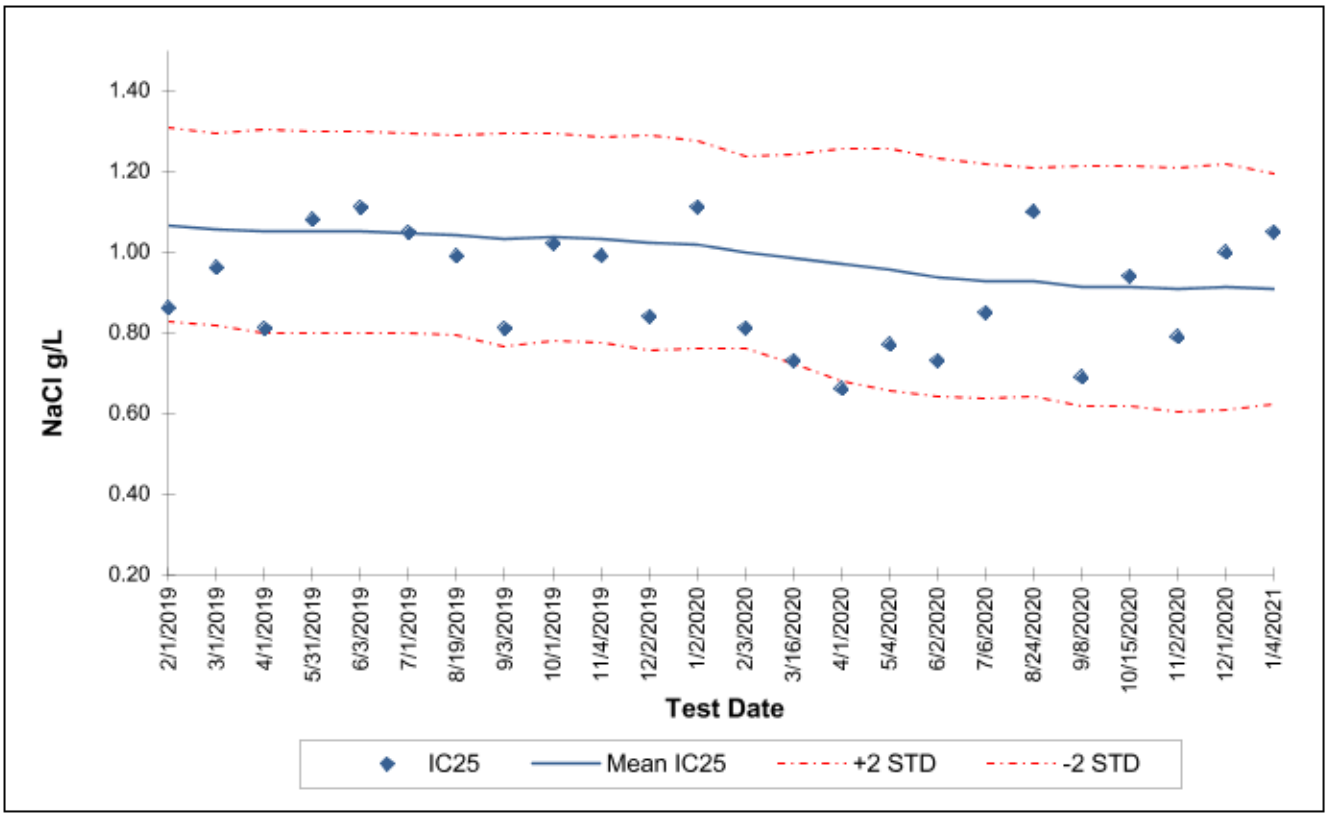
Effluent COC# C41-1169
Receiving Water COC# C41-1170

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

REFERENCE TOXICANT CHARTS

New England Bioassay

Reference Toxicant Data: Sodium chloride (NaCl) *Ceriodaphnia dubia* Chronic Reproduction IC_{25}



Test ID	Date	IC_{25}	Mean IC_{25}	STD	-2STD	+2STD	Avg. CV	Repro PMSD (%)	Avg. PMSD (%)
19-177	2/1/2019	0.86	1.07	0.12	0.82	1.31	0.11	18.71	21.63
19-265	3/1/2019	0.96	1.06	0.12	0.82	1.29	0.11	19.84	22.13
19-403	4/1/2019	0.81	1.05	0.13	0.80	1.30	0.12	10.09	21.85
19-674	5/31/2019	1.08	1.05	0.12	0.80	1.30	0.12	15.59	21.93
19-688	6/3/2019	1.11	1.05	0.12	0.80	1.30	0.12	15.24	22.23
19-926	7/1/2019	1.05	1.04	0.12	0.80	1.29	0.12	12.60	22.23
19-1154	8/19/2019	0.99	1.04	0.12	0.79	1.29	0.12	24.17	22.24
19-1226	9/3/2019	0.81	1.03	0.13	0.77	1.29	0.13	19.49	21.64
19-1396	10/1/2019	1.02	1.04	0.13	0.78	1.29	0.12	18.01	21.38
19-1560	11/4/2019	0.99	1.03	0.13	0.77	1.28	0.12	14.03	21.13
19-1696	12/2/2019	0.84	1.02	0.13	0.76	1.29	0.13	25.84	21.59
20-2	1/2/2020	1.11	1.02	0.13	0.76	1.27	0.13	24.34	22.16
20-132	2/3/2020	0.81	1.00	0.12	0.76	1.24	0.12	22.80	22.15
20-366	3/16/2020	0.73	0.98	0.13	0.72	1.24	0.13	10.30	21.85
20-428	4/1/2020	0.66	0.97	0.14	0.68	1.26	0.15	17.88	20.99
20-587	5/4/2020	0.77	0.96	0.15	0.66	1.26	0.16	30.12	21.22
20-711	6/2/2020	0.73	0.94	0.15	0.64	1.23	0.16	12.08	19.76
20-932	7/6/2020	0.85	0.93	0.14	0.64	1.22	0.16	24.70	20.32
20-1198	8/24/2020	1.10	0.93	0.14	0.64	1.21	0.15	39.42	21.24
20-1286	9/8/2020	0.69	0.91	0.15	0.62	1.21	0.16	29.35	21.54
20-1516	10/15/2020	0.94	0.91	0.15	0.61	1.21	0.16	12.44	21.05
20-1609	11/2/2020	0.79	0.91	0.15	0.60	1.21	0.17	11.83	20.22
20-1738	12/1/2020	1.00	0.91	0.15	0.61	1.22	0.17	9.35	19.96
21-8	1/4/2021	1.05	0.91	0.14	0.62	1.19	0.16	14.78	18.88

National 75th Percentile and 90th Percentile CV Averages for Ceriodaphnia Reproduction IC25 (EPA 833-R-00-003): 0.45 - 0.62
PMSD Upper and Lower Bounds for Ceriodaphnia Reproduction (EPA-821-R-02-013): 13% - 47%